Gun Violence | Climate Conversation | Missiles and Saucers | Searching for Yowie

Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

Vol. 40 No. 2 | March/April 2016

BIOLOGICAL RACE AND HUMAN DIVERSITY

THE OBJECTIVITY ILLUSION

A NUMERATE LIFE: JOHN ALLEN PAULOS

SKEPTICISM AND THE NATURE OF MIND

SCIENTIFIC METHOD. . . AND THE BIBLE?

Published by the Center for Inquiry in association with the Committee for Skeptical Inquiry

CSI
Committee for Skeptical Inquiry

Ronald A. Lindsay, President
Barry Karr, Executive Director
Joe Nickell, Senior Research Fellow

Massimo Polidoro, Research Fellow
Benjamin Radford, Research Fellow
Richard Wiseman, Research Fellow

A PROGRAM OF THE
CENTER FOR INQUIRY

www.csicop.org

Fellows

James E. Alcock*, psychologist, York Univ., Toronto
Marcia Angell, MD, former editor-in-chief, *New England Journal of Medicine*
Kimball Atwood IV, MD, physician; author; Newton, MA
Stephen Barrett, MD, psychiatrist; author; consumer advocate, Allentown, PA
Willem Betz, MD, professor of medicine, Univ. of Brussels
Irving Biederman, psychologist, Univ. of Southern CA
Susan Blackmore, visiting lecturer, Univ. of the West of England, Bristol
Sandra Blakeslee, science writer; author; *New York Times* science correspondent
Mark Boslough, physicist, Sandia National Laboratories, Albuquerque, NM
Henri Broch, physicist, Univ. of Nice, France
Jan Harold Brunvand, folklorist; professor emeritus of English, Univ. of Utah
Mario Bunge, philosopher, McGill Univ., Montreal
Robert T. Carroll, emeritus professor of philosophy, Sacramento City College; writer
Sean B. Carroll, molecular geneticist; vice president for science education, Howard Hughes Medical Institute, Madison, WI
Thomas R. Casten, energy expert; founder and chairman, Recycled Energy Development, Westmont, IL
John R. Cole, anthropologist; editor, National Center for Science Education
K.C. Cole, science writer; author; professor, Univ. of Southern California's Annenberg School of Journalism
John Cook, climate communication research fellow for the Global Change Institute at the Univ. of Queensland, Australia.
Frederick Crews, literary and cultural critic; professor emeritus of English, Univ. of CA, Berkeley
Richard Dawkins, zoologist, Oxford Univ.
Geoffrey Dean, technical editor, Perth, Australia
Cornelis de Jager, professor of astrophysics, Univ. of Utrecht, the Netherlands
Daniel C. Dennett, Austin B. Fletcher Professor of Philosophy and director of Center for Cognitive Studies, Tufts Univ.
Ann Druyan, writer and producer; CEO, Cosmos Studios, Ithaca, NY
Sanal Edamaruku, president, Indian Rationalist Association and Rationalist International
Edzard Ernst, professor, Complementary Medicine, Peninsula Medical School, Universities of Exeter and Plymouth, Exeter, UK
Kenneth Feder, professor of anthropology, Central Connecticut State Univ.
Krista Federspiel, science journalist, expert on complementary and alternative medicine, Vienna, Austria.
Barbara Forrest, professor of philosophy, SE Louisiana Univ.
Andrew Fraknoi, astronomer, Foothill College, Los Altos Hills, CA
Kendrick Frazier*, science writer; editor, Skeptical Inquirer
Christopher C. French, professor, Department of Psychology, and head of the Anomalistic Psychology Research Unit, Goldsmiths College, Univ. of London
Julia Galef, host of the Rationally Speaking podcast; cofounder, Center for Applied Rationality, Berkeley, CA
Luigi Garlaschelli, chemist, Università di Pavia (Italy); research fellow of CICAP, the Italian skeptics group
Maryanne Garry, professor, School of Psychology, Victoria Univ. of Wellington, New Zealand
Murray Gell-Mann, professor of physics, Santa Fe Institute; Nobel laureate
Thomas Gilovich, psychologist, Cornell Univ.
David H. Gorski, cancer surgeon and researcher at Barbara Ann Karmanos Cancer Institute and chief of breast surgery section, Wayne State University School of Medicine.
Wendy M. Grossman, writer; founder and first editor, *The Skeptic* magazine (UK)
Susan Haack, Cooper Senior Scholar in Arts and Sciences, professor of philosophy and professor of Law, Univ. of Miami
Harriet Hall*, MD, physician; investigator, Puyallup, WA
David J. Helfand, professor of astronomy, Columbia Univ.
Terence M. Hines, prof. of psychology, Pace Univ., Pleasantville, NY.
Douglas R. Hofstadter, professor of human understanding and cognitive science, Indiana Univ.
Gerald Holton, Mallinckrodt Professor of Physics and professor of history of science, Harvard Univ.
Ray Hyman*, psychologist, Univ. of Oregon
Stuart D. Jordan, NASA astrophysicist emeritus; science advisor to Center for Inquiry Office of Public Policy, Washington, DC
Barry Karr, executive director, Committee for Skeptical Inquiry, Amherst, New York
Lawrence M. Krauss, foundation professor, School of Earth and Space Exploration and Physics Dept.; director, Origins Initiative, Arizona State Univ.
Harry Kroto, professor of chemistry and biochemistry, Florida State Univ.; Nobel laureate
Edwin C. Krupp, astronomer; director, Griffith Observatory, Los Angeles, CA
Lawrence Kusche, science writer
Leon Lederman, emeritus director, Fermilab; Nobel laureate in physics
Stephan Lewandowsky, psychologist, School of Experimental Psychology and Cabot Institute, Univ. of Bristol, UK
Scott O. Lilienfeld*, psychologist, Emory Univ., Atlanta, GA
Lin Zixin, former editor, *Science and Technology Daily* (China)
Jere Lipps, Museum of Paleontology, Univ. of CA, Berkeley
Elizabeth Loftus*, professor of psychology, Univ. of CA, Irvine
Daniel Loxton, author, editor of *Junior Skeptic* at *Skeptic* magazine (US), artist, Vancouver, B.C., Canada
David Marks, psychologist, City Univ., London
Mario Mendez-Acosta, journalist and science writer, Mexico City
Kenneth R. Miller, professor of biology, Brown Univ.
David Morrison, space scientist, NASA Ames Research Center
Richard A. Muller, professor of physics, Univ. of CA, Berkeley
Joe Nickell, senior research fellow, CSI
Jan Willem Nienhuys, mathematician, Waalre, The Netherlands
Lee Nisbet, philosopher, Medaille College
Steven Novella*, MD, assistant professor of neurology, Yale Univ. School of Medicine
Bill Nye, science educator and television host, Nye Labs
James E. Oberg, science writer
Irmgard Oepen, professor of medicine (retired), Marburg, Germany
Paul Offit, professor of pediatrics, director of the Vaccine Education Center, the Children's Hospital of Philadelphia
Naomi Oreskes, geologist and professor, departments of the History of Science and Earth and Planetary Sciences, Harvard Univ., Cambridge, MA
Loren Pankratz, psychologist, Oregon Health Sciences Univ.
Robert L. Park, professor of physics, Univ. of Maryland
Jay M. Pasachoff, Field Memorial Professor of Astronomy and director of the Hopkins Observatory, Williams College
John Paulos, mathematician, Temple Univ.
Clifford A. Pickover, scientist, author, editor, IBM T.J. Watson Research Center.
Massimo Pigliucci, professor of philosophy, City Univ. of New York—Lehman College
Steven Pinker, cognitive scientist, Harvard Univ.
Massimo Polidoro, science writer; author; executive director of CICAP, Italy
James L. Powell, geochemist, author, professor; executive director, National Physical Science Consortium; retired college and museum president, Buellton, CA
Anthony R. Pratkanis, professor of psychology, Univ. of CA, Santa Cruz
Donald R. Prothero, paleontologist/geologist, Natural History Museum of Los Angeles County, Los Angeles, CA
Benjamin Radford, investigator; research fellow, Committee for Skeptical Inquiry
James "The Amazing" Randi, magician; CSICOP founding member; founder, James Randi Educational Foundation
Milton Rosenberg, psychologist, Univ. of Chicago
Amardeo Sarma*, chairman, GWUP, Germany
Richard Saunders, president, Australian Skeptics; educator; investigator; podcaster; Sydney, Australia
Joe Schwarcz, director, McGill Office for Science and Society
Eugenie C. Scott*, physical anthropologist; chair, advisory council , National Center for Science Education
Robert Sheaffer, science writer
Seth Shostak, senior astronomer, SETI Institute, Mountain View, CA
Simon Singh, science writer; broadcaster; UK
Dick Smith, entrepreneur, publisher, aviator, adventurer, Terrey Hills, N.S.W., Australia
Keith E. Stanovich, cognitive psychologist; professor of human development and applied psychology, Univ. of Toronto
Karen Stollznow*, linguist; skeptical investigator; writer; podcaster
Jill Cornell Tarter, astronomer, SETI Institute, Mountain View, CA
Carol Tavris, psychologist and author, Los Angeles, CA
David E. Thomas*, physicist and mathematician, Socorro, NM
Neil deGrasse Tyson, astrophysicist and director, Hayden Planetarium, New York City
Indre Viskontas, cognitive neuroscientist, tv and podcast host, and opera singer, San Francisco, CA
Stuart Vyse, psychologist, former Joanne Toor Cummings '50 professor of psychology, Connecticut College; author of *Believing in Magic: The Psychology of Superstition*, Stonington, CT
Marilyn vos Savant, *Parade* magazine contributing editor
Steven Weinberg, professor of physics and astronomy, Univ. of Texas at Austin; Nobel laureate
E.O. Wilson, Univ. professor emeritus, organismic and evolutionary biology, Harvard Univ.
Richard Wiseman, psychologist, Univ. of Hertfordshire, England
Benjamin Wolozin, professor, Department of Pharmacology, Boston Univ. School of Medicine

* Member, CSI Executive Council (Affiliations given for identification only.)

The Skeptical Inquirer (ISSN 0194-6730) is published bimonthly by the Center for Inquiry in association with the Committee for Skeptical Inquiry, P.O. Box 703, Amherst, NY 14226. Printed in U.S.A. Periodicals postage paid at Buffalo, NY, and at additional mailing offices. Subscription prices: one year (six issues), $35; two years, $60; three years, $84; single issue, $5.99. Canadian and foreign orders: Payment in U.S. funds drawn on a U.S. bank must accompany orders; please add US$10 per year for shipping. Canadian and foreign customers are encouraged to use Visa or MasterCard.

Inquiries from the media and the public about the work of the Committee should be made to Barry Karr, Executive Director, CSI, P.O. Box 703, Amherst, NY 14226-0703. Tel.: 716-636-1425. Fax: 716-636-1733. Email: bkarr@centerforinquiry.net.

Manuscripts, letters, books for review, and editorial inquiries should be sent to Kendrick Frazier, Editor, Skeptical Inquirer, EMAIL: kendrickfrazier@comcast.net. Mail: 944 Deer Drive NE, Albuquerque, NM 87122. Before submitting any manuscript, please consult our Guide for Authors for style and reference requirements and submittal instructions. It is on our website at www.csicop.org/publications/guide.

Articles, reports, reviews, and letters published in the Skeptical Inquirer represent the views and work of individual authors. Their publication does not necessarily constitute an endorsement by CSI or its members unless so stated.
Copyright ©2016 by the Center for Inquiry and the Committee for Skeptical Inquiry. All rights reserved.
Subscriptions and changes of address should be addressed to: Skeptical Inquirer, P.O. Box 703, Amherst, NY 14226-0703. Or call toll-free 1-800-634-1610 (outside the U.S. call 716-636-1425). Old address as well as new are necessary for change of subscriber's address, with six weeks advance notice. Skeptical Inquirer subscribers may not speak on behalf of CSI or the Skeptical Inquirer. Postmaster: Send changes of address to Skeptical Inquirer, P.O. Box 703, Amherst, NY 14226-0703.

Skeptical Inquirer March/April 2016 | Vol. 40, No. 2

FEATURES

33
Biological Race and the Problem of Human Diversity
Is biological race a mere myth or a troublesome fact better left unexplored?
KENNETH W. KRAUSE

40
Skepticism and the Nature of the Mind
A better understanding of the somewhat elusive nature of the mind can help the skeptical community comprehend popular beliefs.
DANIEL A. VOGEL

45
The Mote in Thy Brother's Eye
People suffer from an illusion of objectivity.
THOMAS GILOVICH AND LEE ROSS

49
A Numerate Life
The man who brought us *Innumeracy* conveys concerns and questions we should have about biographies . . . or our own lives.
JOHN ALLEN PAULOS

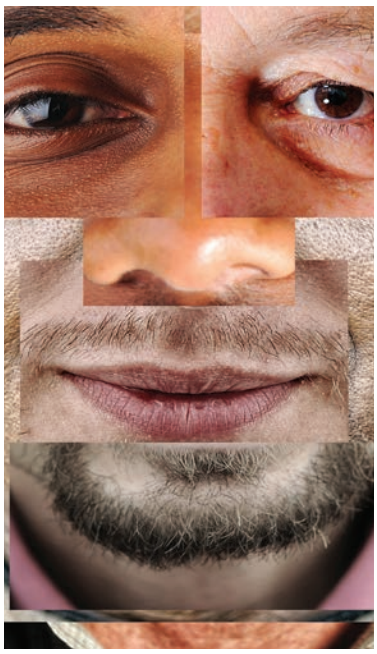
53
Does the Scientific Method Have Biblical Origins?
Two astounding claims from a Christian ministry are evaluated.
BRIAN BOLTON

SPECIAL REPORT

12
Another Really Bad Week for the Supplements Industry, Including Criminal Charges
STEVEN SALZBERG

FORUM

14
Divine Providence or Divine Malfeasance: A Skeptical Inquiry
NICHOLAS S. MOLINARI



COLUMNS

FROM THE EDITOR
Specific Claims and Broad Concerns...4

NEWS AND COMMENT
Creepy Clowns Stalk U.K. Children? Reality and Folklore / Hungarian Academy of Sciences Proposes Homeopathic Drugs Meet Tests of Efficacy / Halloween Candy Scare Hoaxes / Henry Gordon Book Collection to CFI / CSI Fellow Seth Shostak Wins Carl Sagan Prize / 'Sea Monster' Photographed in Greek Islands Never Was Alive / Edzard Ernst Receives 2015 John Maddox Prize 5

INVESTIGATIVE FILES
Searching for the Yowie, the Down Under Bigfoot
JOE NICKELL 16

NOTES ON A STRANGE WORLD
In Search of Mary Magdalene
MASSIMO POLIDORO 19

PSYCHIC VIBRATIONS
Missiles and Saucers
ROBERT SHEAFFER 22

THE SCIENCE OF SCIENCE COMMUNICATION
Shifting the Conversation about Climate Change
MATTHEW NISBET 24

BEHAVIOR & BELIEF
Guns: Feeling Safe ≠ Being Safe
STUART VYSE 27

SKEPTICAL INQUIREE
Cyptozoology and Global Warming
BENJAMIN RADFORD 31

NEW AND NOTABLE 61

LETTERS TO THE EDITOR 64

THE LAST LAUGH 66

REVIEWS

Clear Thinking About Cancer
HARRIET HALL 57
This Book Won't Cure Your Cancer
by Gideon Burrows

A Celebrity's Experience in Scientology
WENDY M. GROSSMAN 60
Troublemaker: Surviving Hollywood and Scientology
by Leah Remini

The Physics of Martial Arts
PETER HUSTON 62
Fight Like a Physicist: Make Physics Your Advantage in the Ring and on the Street
by Jason Thalken

Committee for Skeptical Inquiry
"... promotes scientific inquiry, critical investigation, and the use of reason in examining controversial and extraordinary claims."

[FROM THE EDITOR

Specific Claims and Broad Concerns

Every issue of the Skeptical Inquirer presents an eclectic mix of detailed investigations of specific claims or mysteries and scientific and scholarly examinations of broader problems and issues. The former addresses our intense curiosities, the latter our concerns about issues that affect us all. With both, we try to provide the best possible scientific and scholarly evidence and the most knowledgeable and experienced critical insights and perspectives, all aimed to get as close as possible to the truth. Our goal is not to tantalize but to explain, not to provoke but to understand.

This issue of SI is no exception. Specific investigations include Joe Nickell's search for the Australian Yowie, Massimo Polidoro's consideration of Mary Magdalene, Robert Sheaffer's report on the many recent UFO sightings due to aerial pyrotechnics by the world's space programs, and Ben Radford's wry consideration of how global warming might affect any possible cryptids living out there. And we report relevant news: Steven Salzberg's special report on long-needed legal actions against the supplements industry and news of what a Greek "sea monster" seen by many really was (hint: it was never alive).

And then to broader issues of social concern. In the careful, science-based manner our readers have come to expect, our cover article considers a topic that can be emotionally charged: the science of race, specifically the question of whether race is a myth, as many scientists and scholars contend, or a real but inconvenient truth. Or perhaps, as suggested, there is an in-between, scientifically informed view of variation within human populations that has more scientific and pragmatic traction and that can better inform and enlighten us. In this important feature article, Kenneth W. Krause, our "Science Watch" columnist since 2010, brings analytical skills honed from his legal background to synthesize and evaluate a large amount of recent scientific research on the issue of biological race and human diversity.

In the first of a new column on "Behavior and Belief," award-winning psychology professor Stuart Vyse tackles another hot-button issue, gun violence, with what the *science* shows, in "Guns: Feeling Safe ≠ Being Safe." And another new columnist, Matt Nisbet, associate professor of communication at Northeastern University and a longtime colleague of ours, offers better communications strategies for dealing with opposition to climate science.

In their feature article "The Mote in Thy Brother's Eye," the distinguished psychology professors Thomas Gilovich and Lee Ross illuminate the illusion of objectivity, a bias we all share in which we can all easily detect biased thinking in others while our own biases seem strangely inaccessible to our own self-awareness. This is a profound effect, and they have demonstrated it in a number of recent studies. The objectivity illusion is a prevalent aspect of human nature; it explains why it is so difficult for us to understand how other people can be so wrong all the time. They may have the same thought about you. And me.

—Kendrick Frazier

Skeptical Inquirer™
THE MAGAZINE FOR SCIENCE AND REASON

EDITOR Kendrick Frazier
DEPUTY EDITOR Benjamin Radford
MANAGING EDITOR Julia Lavarnway
ASSISTANT EDITOR Nicole Scott
ART DIRECTOR Christopher Fix
PRODUCTION Paul E. Loynes
WEBMASTER Matthew Licata
PUBLISHER'S REPRESENTATIVE Barry Karr

EDITORIAL BOARD James E. Alcock, Harriet Hall, Ray Hyman, Scott O. Lilienfeld, Elizabeth Loftus, Joe Nickell, Steven Novella, Amardeo Sarma, Eugenie C. Scott, Karen Stollznow, David E. Thomas, Leonard Tramiel

CONSULTING EDITORS Susan J. Blackmore, Kenneth L. Feder, Barry Karr, E.C. Krupp, Jay M. Pasachoff, Richard Wiseman

CONTRIBUTING EDITORS D.J. Grothe, Harriet Hall, Kenneth W. Krause, David Morrison, James E. Oberg, Massimo Pigliucci, Robert Sheaffer, David E. Thomas

Published in association with
CENTER FOR INQUIRY

CHAIR Edward Tabash
CHIEF EXECUTIVE OFFICER Robyn Blumner
PRESIDENT Ronald A. Lindsay
CHIEF FINANCIAL OFFICER Barry Karr
CORPORATE COUNSEL Brenton N. VerPloeg, Nicholas J. Little
BUSINESS MANAGER Patricia Beauchamp
FISCAL OFFICER Paul Paulin
SUBSCRIPTION DATA MANAGER Jacalyn Mohr
COMMUNICATIONS DIRECTOR Paul Fidalgo
DIRECTOR OF LIBRARIES Timothy S. Binga
DEVELOPMENT DIRECTOR Martina Fern
DIRECTOR, COUNCIL FOR SECULAR HUMANISM Tom Flynn
DIRECTOR, CAMPUS AND COMMUNITY PROGRAMS Debbie Goddard
DIRECTOR, AFRICAN AMERICANS FOR HUMANISM Debbie Goddard

BOARD OF DIRECTORS R. Elisabeth Cornwell, Brian Engler, Kendrick Frazier, Barry A. Kosmin, Edward Tabash (chair), Leonard Tramiel. (Honorary): Rebecca Goldstein, Susan Jacoby, Lawrence Krauss.

Gun Violence | Climate Conversation | Missiles and Saucers | Searching for Yowie
Skeptical Inquirer
BIOLOGICAL RACE AND HUMAN DIVERSITY
THE OBJECTIVITY ILLUSION
A NUMERATE LIFE: JOHN ALLEN PAULOS
SKEPTICISM AND THE NATURE OF MIND
SCIENTIFIC METHOD... AND THE BIBLE?

Is biological race a mere myth or a troublesome fact better left unexplored? Some might suggest that, properly conceived, race is neither fable nor farce but rather a potential windfall for both science and society. See page 33.

Creepy Clowns Stalk U.K. Children? Reality and Folklore

Benjamin Radford

Reports surfaced in England shortly before Halloween 2015 of people dressed as clowns stalking and trying to abduct—or at the very least scaring—children. According to the October 16, 2015, *Daily Mirror*:

> Pupils have been warned to "go straight home after school today and not to loiter" as reports continue of schoolchildren being stalked by clowns. Kent Police have issued the caution after a number of "suspicious incidents" in Tonbridge and Tunbridge Wells, in Kent. . . . Since then, there have been reports of people wearing clown masks being spotted in a van on St. John's Road in Tunbridge Wells on Tuesday and Wednesday. Schools in the town issued their own advice after a boy was approached by two men in a van on Wednesday morning. Luckily he ran away and told his school what had happened. (see http://tinyurl.com/pzzzavh)

This is not the first time that clowns have been reported terrorizing people. Over the years, a handful of mysterious clowns have appeared in cities around the world with the apparent intent to frighten and unnerve the public. It happened almost exactly a year earlier in the California towns of Bakersfield and Wasco, followed by a series of attacks by clowns in several French cities (see http://tinyurl.com/ovbvjgm). Before that, a weird clown was reported in Northampton, England, and then Staten Island. And in July 2015, a creepy clown was sighted at night in a Chicago cemetery.

When a clown treads on private property, that's potentially a trespassing crime that may result in authorities being called—and the clown identified, his or her motives determined, and possibly arrested. Clowns appearing in public are another matter: there's no law against anyone in a costume walking down the street or visiting a public park. While most of these reports were determined to be hoaxes, pranks, and publicity stunts, the recent reports from Britain are a bit different, being dubbed phantom clowns—"phantom" because they are reported but never caught.

Though some sensational stories of child-abducting clowns were an invention of the news media, a few children reported firsthand abduction attempts.

Writer Loren Coleman coined the term *phantom clowns* and described them in his book *Mysterious America*. One of the first reports of phantom clowns occurred on May 6, 1981, when police in Brookline, Massachusetts, issued an all-points bulletin asking officers to watch for a vehicle containing potential child abductors. The vehicle was distinctive: an older-model van with a broken headlight, no hubcaps, and ladders on the side. It was also full of clowns. Several children reported that clowns had tried to lure them into the dark van with promises of candy; police investigated but found nothing.

Though some sensational stories of child-abducting clowns were an invention of the news media, a few children reported firsthand abduction attempts. One boy told police that he had been confronted by a clown armed with an Uzi machine gun in one hand and a machete in the other. The clown fired off five shots, but the boy counterattacked the surprised clown by throwing his book bag at him. Deciding that an Uzi and a machete were no match for a small bag of schoolbooks, the clown lost his nerve and ran off. Not surprisingly, the boy later admitted that he had made up the whole story, probably for attention.

Though the 1980s and 1990s were the heyday of phantom clown sightings, a few reports have continued in recent years. Throughout the phantom clown panic no hard evidence was ever found that the clowns even existed, and no children were actually harmed or abducted.

The phantom clowns appeared in connection with other rumors and urban legends. As folklorists Gillian Bennett and Paul Smith wrote in *Urban Legends: A Collection of International Tall Tales and Terrors,* the phantom clown panic was "caused by an urban legend that circulated exclusively among children by word of mouth," fueled in part by parental concern.

Folklorists Sandy Hobbs and David Cornwell examined the origins of the phantom clowns in their chapter in the book *Supernatural Enemies*, asking:

> How did this rumor of evil clowns originate? Many of our informants suggest possible origins of the clown story: parents, police, and the mass media are all cited. One student reports that older children told the stories to frighten younger ones. Others appear to assume that the story derives from an actual incident, even though it may have become exaggerated in the telling.

Whether the recent British sightings are hoaxes, pranks, or a genuine menace, parents and children can take comfort in the fact that the phantom clowns never actually succeeded in abducting any children (or anyone else). For anyone genuinely trying to abduct children, a clown costume is perhaps the worst possible disguise because it attracts attention—especially in light of the warnings and publicity surrounding the sightings. Any clowns seen near schools, parks, or children that are not part of a private party, parade, or circus are certain to draw notice and attention.

For anyone genuinely trying to abduct children, a clown costume is perhaps the worst possible disguise.

Most scary clown sightings are innocuous, such as a person wearing a clown mask in public—perhaps not surprising given that Halloween was only a few weeks away. And of course just because a person is frightened by a person in a clown mask doesn't necessarily mean the clown had any evil intent. But motivations become irrelevant in parents' eyes when it comes to children's safety, and many communities were understandably taking measures to ensure safety.

Benjamin Radford is deputy editor of the Skeptical Inquirer and author of the forthcoming book *Bad Clowns*.

Hungarian Academy of Sciences Proposes Homeopathic Drugs Meet Tests of Efficacy

Gábor Hraskó

Members of the Section of Medical Sciences of the Hungarian Academy of Sciences (HAS) voted unanimously on November 9, 2015, to support an earlier proposal of the Royal Swedish Academy of Sciences about homeopathy. The Swedish statement requested that homeopathic remedies should go through the same efficacy trials that mainstream drugs do.

The Hungarian statement refers to various recent scientific statements, for example, the study of the Australian Government's National Health and Medical Research Council that analyzed 175 publications and concluded that there was no reasonable scientific proof for the efficacy of homeopathy for any health conditions. The HAS also refers to the European Academies Science Advisory Council that is allegedly considering an investigation among the academies of the U.N. countries about this topic. The statement points out that another Hungarian scientific body (Health Science Committee, Egészségügyi Tudományos Tanács) had made a similar statement in 1991 and opposed using and registering those drugs whose efficacy had not been proved and that had not gone through adequate research procedures.

A 2010 statement of the Complementary Medicine Committee of the HAS correctly noted that while there is a legal and public demand in conventional medicine to prove the efficacy and safety of its products and procedures, "nonconventional" or alternative medicine is exempted from these obligations. Based on the recent legislation, complementary medicine is the same as evidence-free medicine, and this might mean a serious risk for the patients.

József Mandl, a biochemist, member of HAS, and president of the Health Science Committee, said:

> The Australian and Swedish statements had raised the interest of the Hungarian scientific community and now members of the Medical Sciences Section of the Hungarian Academy of Sciences voted unanimously to join the Swedish initiative. . . . Science has well defined, rigorous methods and systems. Homeopathy can't be fitted to these. Homeopathic remedies don't meet the criteria of evidence-based medicine. There might be various hypotheses and theories, but everything should be proved. This is what science means and this is what we would like to highlight now.

Gábor Hraskó is chairman of the European Council of Skeptical Organizations, president of the Hungarian Skeptics, and a Committee for Skeptical Inquiry Scientific Consultant.

Halloween Candy Scare Hoaxes

Benjamin Radford

On Halloween weekend 2015, scary news reports and warnings on social media claimed that dangerous candy had been found, raising fears among parents and children. A week after Halloween—after the candy had been eaten and the proverbial fairy dust had settled—the comforting truth about the latest candy scare finally came to light: Police determined that the incidents were hoaxes.

For example, a Philly.com news report stated that an eleven-year-old girl and a twelve-year-old boy "who reported finding needles in their trick-or-treat candy in Kennett Square have admitted they made up the story. . . . The girl hid needles from her mother's sewing kit in Twix bars she was given while trick-or-treating, prosecutors said. She then lied to her parents, who prosecutors said rightly reported the incident to police. The boy heard about the first case, then put a needle inside a Snickers bar that he showed his older sister, who contacted police" (see http://tinyurl.com/ojjd752).

Kids do stupid things, but adults are in on the fear-mongering as well. At least one person was arrested for faking tainted candy in New Jersey; according to the same story, "Gloucester Township police said 37-year-old Robert Ledrew reported that he found needles in four separate pieces of trick-or-treating candy. Prior to calling police, he posted photos of one of the alleged needles on social media. But investigators determined that Ledrew . . . made up the story and put the needles in the candy bars himself, police said. He was charged with making a false report and released on a summons, officials said." Ledrew claimed he had put the needles in the candy to teach his kids a lesson about safety.

News of Ledrew's arrest may have kept some of the tainted candy reports from being solved; pranksters who might otherwise consider coming forward to calm nerves in their household or community may not have done so out of fear they would be arrested, and decided it's better to let the case remain unsolved. The nature of tainted Halloween candy is such that it's a very easy thing to fake and very difficult to investigate.

Kids and others get the idea to pretend to find tainted Halloween candy mostly from popular culture and the news media.

There were no confirmed reports of anyone actually being injured or harmed by contaminated Halloween candy from strangers; there seem to be no news reports of children being taken to the hospital and having to undergo emergency surgery as a result of a foreign object accidentally being eaten. Instead it's always a near-miss, a case of "look what we found before anyone was hurt."

The tainted candy scares this past Halloween—as in previous Halloweens—have been the result of hoaxers and copycats. Why would someone fake such a horrible thing? For fun, attention, sympathy, or any number of other reasons. Kids and others get the idea to pretend to find tainted Halloween candy mostly from popular culture and the news media. This is a process that folklorists call "ostension." Scary themes are especially common in ostension, for example when ghost hunters seek out spirits in a reputedly haunted location, or when girls perform the Bloody Mary ritual to summon a witch from a mirror. Putting a needle in candy gives kids a personal role in real-life legend-making, a sinister form of "let's pretend"—which is of course what costumed trick-or-treating is all about.

Police and the news media are in a difficult position. Until the tainted candy reports are disproven, it seems prudent to warn parents that apparent cases have happened. But the irony is that the more people hear about these (hoaxed) cases through the news and social media, the more likely it is that someone will be inspired to do a copycat hoax for attention or sympathy. It is very easy to fake finding some foreign substance in candy; all you need are needles, thumbtacks, nails, or any other common household object that could be harmful if eaten. It takes mere seconds to put it in a piece of candy and then innocently ask someone nearby, "Hey, what is this?"

The candy scare is part of the ven-

erable "stranger danger" theme common in American culture, fueling fears that evil strangers are hoping to hurt innocent children. Few if any sinister foreign objects are ever found in Halloween candy. This threat is essentially an urban legend; there have been only two confirmed cases of children being killed by poisoned Halloween candy, and in both cases the children were killed not in a random act by strangers but murdered by one of their parents.

While the fact that children and adults have been caught faking tainted candy is troubling, the good news is that the world is not such a scary place.

Sociologists Joel Best and Gerald Horiuchi researched news stories on Halloween sadists and found the threat to be "greatly exaggerated." They discovered the fear of razor blades in apples and poisoned candy was fueled largely by the news media. Best and Horiuchi concluded that most reports of Halloween sadism appear to be imaginary, and that many are hoaxes by kids themselves seeking attention and sympathy. The myth-busting website Snopes.com also updates its section on tainted candy every year. While the fact that children and adults have been caught faking tainted candy is troubling, the good news is that the world is not such a scary place, since strangers are not in fact trying to harm or kill random innocent children.

Henry Gordon Book Collection to CFI

Timothy Binga

The Center for Inquiry Libraries (www.cfilibraries.org) has received a small but significant collection of books on magic and conjuring from Henry Gordon (1920–2009) and his wife, Zita. Gordon was a stage magician, doing conjuring and magic he called "sleight of mind." He was a CSICOP (now CSI) fellow, writer, broadcaster, and president of the Ontario Skeptics.

Gordon began his career as a magician and paranormal skeptic in his hometown of Montreal, where he began writing for various venues, such as *Suburban*, and later a weekly column for the *Toronto Star*. He became known not only for his magic but also for his skepticism and was a pioneer of the skeptical movement in Canada. Up until the founding of CSICOP in 1976, Gordon felt as if he were the only one doing this kind of work.

As he received more and more attention for his magic and skepticism, he appeared on many television and radio shows, beginning on CBC in Toronto, and eventually becoming a guest on such shows as *Oprah* and *Sally Jessy Raphael*. He had done many shows where he was introduced as a psychic and would later reveal himself as a skeptic.

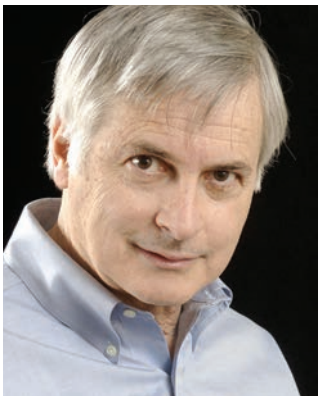
Gordon wrote several books. *Extrasensory Deception* (Prometheus Books, 1987) was taken from his columns in the *Toronto Star*, which ran for three years. *It's Magic* (Prometheus Books, 1989) is a book of easy-to-learn magic tricks for children. *Channeling into the New Age* (Prometheus Books, 1988) is the result of a lot of material Gordon collected about Shirley MacLaine and "her side career of pushing the paranormal with a series of nonsensical books. . . ." He concedes in his chapter in *Skeptical Odysseys* (Prometheus Books, 2001) that "I don't believe Shirley is my biggest fan."

The collection numbers about 100 books; however, it has many of the classics of the small-object/hand-conjuring genre. Included are such notable books as *Expert at the Card Table* by Erdinase, *The Tarbell Course in Magic* (which has volume 6 signed by the author), and books by Milbourne Christopher, Alton Sharpe, Jerry Mentzer, and Harry Lorayne. Some bound magic trick periodicals were also donated; these include *The Bat*, *The Sphinx*, *The Phoenix*, and *Hugard's Magic Monthly*.

"Henry was a strong believer in science and of maintaining an open and curious mind," says his wife, Zita. "He never denied that a person could have paranormal powers. What he did say is that people should be willing to allow scientific investigation of claims under the kind of conditions any other phenomena would be examined. It is my hope that Henry's magic book collection will assist those who seek a logical and deeper understanding of what may initially be mistaken as the paranormal."

Timothy Binga is director of libraries for the Center for Inquiry.

CSI Fellow Seth Shostak Wins Carl Sagan Prize



The 2015 Carl Sagan Prize for Science Popularization has gone to astronomer and Committee for Skeptical Inquiry Fellow Seth Shostak.

The $5,000 prize comes from Wonderfest, a nonprofit organization in the San Francisco Bay area dedicated to science education and popularization. The prize is funded by Google and presented specifically to recognize researchers who "have contributed mightily to the public understanding and appreciation of science."

Shostak is senior astronomer at the SETI Institute in Mountain View, California, host of the SETI Institute's weekly science radio show, and a frequent public speaker. Additional information is at http://wonderfest.org/sagan-prize.

'Sea Monster' Photographed in Greek Islands Never Was Alive

Benjamin Radford

A strange photo of what appears to be an unknown marine animal taken by a Scottish tourist in the Greek islands made headlines around the world in early November 2015.

According to Fox News, "Harvey Robertson was on a boat cruise off the coast of Parga, sailing through sea caves with his family. He was initially just trying to capture the unusual color of the surrounding water with his iPhone camera." Robertson says he didn't see the animal at the time, but "looking back through his camera, Robertson saw that he had captured a grey creature that resembles an elongated manatee. The strange animal appears to pop out of the water in one photo, then disappears under the greenish water in the next" (see http://tinyurl.com/pdbpnox).

(Continued on p.11)

Edzard Ernst Receives 2015 John Maddox Prize

Ernst, left, with his prize.

Edzard Ernst has received the 2015 John Maddox Prize for his research countering claims of alternative medicine. Ernst, emeritus professor at Peninsula Medical School, Exeter, United Kingdom, was recognized for his long commitment to applying scientific methodologies to research in complementary and alternative medicines and to communicating this need.

The prize recognizes the work of individuals who promote sound science and evidence on a matter of public interest, facing difficulty or hostility in doing so.

The citation notes that Ernst continued in his work despite personal attacks and attempts to undermine his research unit and to end his employment. "As a result he has addressed a significant gap in the research base in this field and has brought insights into discussions with the public, policy makers, commentators, practitioners, and other researchers."

"Thanks to everyone who supported me in often difficult times, and made this possible," Ernst said. "For the past twenty years I have tried to find out the truth about alternative treatments. The results were often not what enthusiasts of alt med had hoped for. But my job was to test and not to promote alternative medicine. So I published our findings and, if necessary, I defended them. . . ."

The Maddox Prize is a joint initiative of the journal *Nature*, the Kohn Foundation, and the charity Sense About Science. It is named for the late Sir John Maddox, a longtime editor of *Nature* and a passionate defender of science. Maddox was a fellow of the Committee for Skeptical Inquiry, as is Ernst.

Take action with us.

You can help promote science, reason, and secular values.

Imagine a world where religion and pseudoscience do not influence public policy—a world where religion no longer enjoys a privileged position. The Center for Inquiry is working toward these goals and educating the public to use science, reason, and secular values rather than religion and pseudoscience to establish public policy.

The Center for Inquiry advances its mission through advocacy, education, and outreach programs. No other organizations advance science and secularism on as many fronts as CFI and its affiliates, the Committee for Skeptical Inquiry and the Council for Secular Humanism.

Donate today.

When you make a donation to CFI, you become a member of a worldwide movement of humanists, skeptics, atheists, and freethinkers—all working together to promote the secular worldview and give voice to your values.

Our major goals include:

- Protecting the rights of nonbelievers
- Advocating for science-based medicine
- Sustaining and expanding the secular movement

Make your most generous gift today, or request information on planned giving or making a bequest.

To receive a brochure elaborating on what we are doing to achieve our important goals and how you can help, please complete and return the attached card or contact us at:

Center for Inquiry
Development Office
PO Box 741
Amherst, NY 14226
1.800.818.7071
development@centerforinquiry.net
www.centerforinquiry.net/donate

cfi CENTER FOR INQUIRY CSI COUNCIL FOR SECULAR HUMANISM

(Continued from p.9)

The viral photo sparked speculation among armchair zoologists and monster lovers about what this bizarre animal might be, ranging from a beaked whale to the "love child of a hippo and crocodile" (best not to dwell on the logistics of that coupling). While the image has some superficially similar features to various animals, it does not in fact look like any known animal.

All the ideas are interesting, but teams of marine biologists packing their bags for a long-term research project in the sunny Greek islands to study the beast may want to hold off on making plane reservations because this chimera was soon identified. Zoologist Darren Naish of the National Oceanography Centre at the University of Southampton and host of the *Tetrapod Zoology* podcast believes that a skin sample biopsy of the "creature" would reveal high concentrations of polyvinyl chloride. In fact, Naish found a near-perfect match for the mysterious monster Robertson photographed: an errant and half-sunken low freeboard fender, used to protect boats from damage.

In an interview published on Discovery News, Naish told me:

> The object never quite made sense as a live animal—what's with that round black marking identified by many as an "eye," and why is there another hole near the tip of what looks like a snout? And where are the flippers or fins? I then remembered seeing extremely similar features in curved boat fenders. These vinyl structures (there are many different types) fit over the gunwales and sides of boats and protect them from dock walls and so on—they often have a shiny look that recalls the skin of animals like dolphins, and this feature obviously made people think that the object looked especially like an animal.

It's not clear whether the photo is a hoax (i.e., Robertson knew what it was when he photographed the object but shared the photo claiming it to be a genuine mystery) or a misidentification (i.e., Robertson genuinely had no idea what it was). The most likely and charitable explanation is that he could have easily guessed what the object was at the time and paid little attention to it until weeks later when he saw the image as he was going through his trip photos. Marine equipment such as thick ropes, fenders, and the like are common and unnoticed in their context but could seem very mysterious out of context.

In other words, had Robertson reviewed the images on his iPhone immediately and noticed it, he could simply have looked over the side of the boat to see what it was; since he didn't, it's a mystery. Others on the same tour boat likely saw exactly the same thing but paid no attention to a half-sunken boat bumper bobbing in the water.

Only later does someone see some apparently strange or mysterious figure and come to think they had been in the presence of a ghost or unusual animal.

This process is common with many ghost photos in which photographs are examined days, weeks, or months after the image was taken. Only later does someone see some apparently strange or mysterious figure and come to think they had been in the presence of a ghost or unusual animal. But by then the opportunity for investigating is long gone.

This Greek hippo-dolphin monster is different, however. Since the photo is almost certainly of a low freeboard fender, it did not disappear and is probably still there for others to photograph for themselves. They are common in ports around the world and not normally of sufficient interest to be worth a photograph.

It is not surprising that people, including many "experts," were fooled by the image; for example, cryptozoologist and author Loren Coleman was quoted in a *Huffington Post* piece as saying, "If the photograph is not a hoax, it could be interesting, cryptozoologically speaking. It might be photographic evidence of a new species or it could be a reconfiguration (a behavioral restructuring of the body form of a mundane known species, like a squid, for example) not usually seen."

Conclusively identifying known marine animals can be difficult under the best of circumstances simply because of the environment. Unlike terrestrial animals that we are used to seeing and identifying from our own eye level and whose feet and legs are visible, animals in water are by definition partly submerged and therefore partly hidden from view, especially when seen from a pier or boat (which gives an unusual view from above and to the side).

In many places where lake monsters have been sighted (for example Scotland's Loch Ness or Canada's Lake Okanagan), the visibility is very poor just below the surface due to suspended sediments. Even in relatively clear water, such as that found in the Greek isles, moving water inevitably causes distortion of the image: colors change, important details are obscured, and so on. Naish notes, "For this fender explanation to work, the object would have to have been heavily distorted by refraction, but this looks plausible based on the photo. Furthermore, features that look like skin folds and so on seem more likely to be scum and reflected light on the water surface."

The object fooled many people because it seems to have an animalian face, complete with a mouth, nostril, eye, and possibly even ears. The fact that the top of the bumper somewhat resembles an elongated face to us is not a coincidence. The human brain is hardwired to recognize faces, and we often see faces and heads in everyday, non-animal objects, including potatoes, rock cliffs, and clouds. We can now add boat fenders to the list, though not a new marine animal to the zoology books.

Another Really Bad Week for the Supplements Industry, Including Criminal Charges

STEVEN SALZBERG

The largely unregulated world of dietary supplements is like the Wild West. Dramatic claims abound, most of them unsupported by evidence, and it's hard to know if any of them can be trusted. Supplement manufacturers claim their products cure cancer, Alzheimer's disease, arthritis, and more. They promise miraculous weight loss results, nebulous "boosting" of your immune system, and anti-aging benefits.

Once in a while, though, they get caught. In mid-November, the United States cracked down hard on several of the more egregious offenders, announcing indictments against half a dozen supplement makers, including criminal charges against one.

It's about time. Consumers everywhere should applaud these actions and encourage more. Here's what happened.

On Tuesday, November 17, 2015, the U.S. Department of Justice (DOJ) indicted USPlabs, a major supplement manufacturer whose products include Jack3d and OxyELITE Pro. The DOJ alleged that USPlabs "doctored packaging, labeling, and other paperwork to defraud others about what the product was." Further, the indictment points out that USPlabs claims that their products are made from natural plant extracts when instead, as one USPlabs defendant put it in an email exchange from May 2009: "lol stuff is completely 100% synthetic."

The fraud runs even deeper: according to the DOJ, after an outbreak of liver injuries associated with OxyELITE Pro, in which some consumers *needed liver transplants* to save their lives, USPlabs "promised the FDA and the public that they would stop distributing the product at issue. They didn't. Instead, they undertook a surreptitious, all-hands-on-deck effort to sell as much of the product as they could."

The criminal indictment, which led to the arrest of six USPlabs employees and consultants, is just one of a sweeping set of actions in that week-long period in November 2015. The DOJ also filed six civil cases against other supplement makers for illegally claiming their products could cure diseases. The allegations include:

- Clifford Woods, LLC, illegally sold Taheebo Life Tea, Germanium, and Organic Sulfur as treatments for Alzheimer's and cancer.
- Optimum Health (aka Lehan Enterprises) illegally sold a product called DMSO cream for arthritis and cancer.
- Regenica Worldwide (aka Vivaceuticals) illegally sold their RegeneSlim as a disease cure; in addition, RegeneSlim contains DMAA, an unsafe food additive under the federal Food, Drug and Cosmetic Act, but does not declare DMAA as an ingredient.

Just to be clear: none of these violations have yet been proven in court. But to be even more clear: none of these products treat or cure cancer, Alzheimer's, arthritis, or any other disease.

In addition to the DOJ actions, the Federal Trade Commission (FTC) indicted three more supplement manufacturers for illegal advertising claims (that's the FTC's purview). One indictment, against Chrystal Ewing and her two companies, Health Nutrition Products LLC and Classic Productions LLC, alleged that:

> In ads for W8-B-Gone, CITRI-SLIM 4 and Quick & Easy diet pills, the defendants featured bogus weight-loss experts. Citing fake scientific studies, the defendants also deceptively claimed to have clinical proof that consumers would experience a "RAPID FAT meltdown diet program" that lets them shed five pounds in four days with one pill, or up to 20 pounds in 16 days with four pills.

Needless to say, none of those products deliver the results they claim.

It's a jungle out there. As the FTC's Jessica Rich said, "People looking for a dietary supplement to improve their health have to wade through a swamp of misleading ads. Be skeptical of ads for supplements that claim to cure diseases, reverse the signs of aging or cause weight loss without diet or exercise."

It appears that major supplement retailers such as GNC have dropped USPlabs like a hot potato. I couldn't find OxyELITE Pro on any of their sites. However, despite the indictments and arrests, USPlabs is still marketing OxyELITE Pro on their own site, where they tout it as the "#1 Selling Fat Burner," with a long list of other claims. What about the liver toxicity cited by the DOJ? The OxyElite web-

There's only one safe way to take supplements: ask your physician

site claims: "OxyELITE Pro shows no side effects in well over 99% of its users. In fact, USPlabs and GNC have stated that there's been over a billion servings of Jack3d and OxyELITE Pro safely taken with no problems!"

The FDA apparently disagrees. In March 2015, they issued a Medication Health Fraud notice that OxyELITE Pro contains a hidden drug ingredient, fluoxetine. Fluoxetine is a type of selective serotonin reuptake inhibitor (SSRI), used for treating depression and other conditions. According to the FDA,

> SSRIs have been associated with serious side effects including suicidal thinking, abnormal bleeding, and seizures. In patients on other medications for common conditions (aspirin, ibuprofen, or other drugs for depression, anxiety, bipolar illness, blood clots, chemotherapy, heart conditions, and psychosis), ventricular arrhythmia or sudden death can occur.

Caveat emptor: these supplements might contain harmful ingredients. There's only one safe way to take supplements: ask your physician. Unless your doctor specifically recommends one, stay away. You'll feel better and your wallet will benefit too. ■

Steven Salzberg is the Bloomberg Distinguished Professor of Biomedical Engineering, Computer Science, and Biostatistics at Johns Hopkins University. He was recipient of the Committee for Skeptical Inquiry's 2009 Robert P. Balles Prize for critical thinking. A version of this column appeared on forbes.com.

Skeptical Inquirer
THE MAGAZINE FOR SCIENCE AND REASON
DIGITAL EDITION
GET IT ON Google play
Available on the App Store
Subscribe to the digital edition of the SKEPTICAL INQUIRER
and read SI on your iPad, iPhone, or Android device!
Download your FREE sample issue today!
Skeptical Inquirer
LYING ABOUT
POLYGRAPH TESTS
The Pseudoscience of Lie Detection
LIAR

Divine Providence or Divine Malfeasance: A Skeptical Inquiry

NICHOLAS S. MOLINARI

The Roman Catholic teaching, doctrine, and dogma of Divine Providence played center stage through my earlier life as a very Catholic youth, a sincere seminarian, and a compassionate priest. As you will see below, I continue to agonize over God's alleged activism in this world long after leaving the priesthood behind.

Dependence on benevolent Providence is most beautifully described and endorsed by Jesus in the Gospel of Luke 12: 22–31 (i.e., God feeds the birds with abundance and clothes the lilies in splendor without being asked). This notion always provided me with a sense of confidence, perhaps to the point of recklessness.

My almsgiving knew no bounds when I had alms to offer because caring for the poor was/is the right thing to do and in any case, God would always provide for my needs. But did he? Does he? I mean, practically speaking, does God feed us and clothe us without significant efforts on our part? Or do our efforts alone effect the desired and undesired results?

Whenever I dare to mention during serious discussions the preponderance of evil in the world, my complaint is usually countered with one or two examples of good being done by this or that person. By this measure, if the scales of justice were ever to be balanced, one act of goodness must weigh at least as much as a thousand acts of evil. Just start counting!

In the film *God on Trial*, Auschwitz prisoners decide to put their god on trial for their terrible suffering.

In 2008, I watched—or more accurately *experienced*—the TV film *God on Trial*. The scene is Auschwitz; the cast is a cluster of starving Jews in a crowded barracks. They cannot comprehend or reconcile their status as "God's Chosen People" with their obvious abandonment (by God) into a hell on earth. Only death can liberate these luckless souls. They decide to put their God on trial with (many) witnesses for the prosecution and (few) character witnesses for God. Ultimately, God is found guilty. Then, as if in vengeful punishment for their insolence, all these Jews are finally put to death by the hateful Nazi apparatus.

Reading a newspaper, watching TV news, and listening to radio broadcasts have become hazardous to one's health, much like cigarette smoking, drugs, and excessive booze. Searching for evidence of *practical* Divine Providence—I confess to being such a seeker—seems a futile occupation and a frustrating task of detection. Particularly infuriating is the sad truth that one religion or another is frequently the source of the hatred that fuels the strife, the violence, and hundreds of wars, large and small, that have been and are being

waged throughout modern human history everywhere on Earth.

Nor is our nation immune from its own peculiar domestic war with its yearly 2.1 million ER visits resulting from assaults involving guns, knives, clubs, fists, and other instruments of violence. Gun homicides now exceed 11,000 annually. Who knows the count of the gun-wounded and maimed? In this regard, we certainly have earned the grandiose appellation "exceptionalism." Americans have been suffering as many casualties or more than in most foreign nations' real civil wars! I suggest to the R.C. hierarchy that these types of violence truly deserve the label "intrinsic evil" meriting condemnation by a sincere teaching Church. But the Bishops seem obsessed with sexual matters and prohibitions, while ignoring deadly gun violence, climate change, severe poverty, the New Jim Crow, the takeover of government by Big Money—just to name a few crises they should be addressing.

So, in the spirit of the peeved Psalmist, here are my petitions to a God who may have gone AWOL:

Lord, if you are really there, please make your existence known to humanity.

Lord, if you are here, please enlighten our species with the light of the truth of brother/sisterhood.

Americans have been suffering as many casualties or more than in most foreign nations' real civil wars!

Lord, if you truly care about human beings, please provide for us all, just as Jesus promised for the birds and lilies.

Lord, if you are watching diligently, please note the atrocities perpetrated throughout the world, without resolution and without your hoped-for intervention.

Lord, if you have the power of persuasion or inspiration, please convince the thousands of terrorists in dozens of groupings to cease and desist in your name . . . rather than terrorizing in your name.

Lord, if you are fully satisfied simply to have created this world, then to have kicked it out into the universe like a soccer ball to fend for itself, please inspire "churchmen" and "churchwomen" of all religions to substitute the dogma of Divine Providence with a more honest one of Human Providence [or Human Malfeasance].

That way, Lord, all of humanity will know, whether choosing to do good or evil, it is strictly up to us, period! ■

Nicholas S. Molinari, BA, STB, received a Catholic education, went to seminary, and became a priest, serving two inner city parishes in Paterson, New Jersey, early in his career. The priesthood failed to measure up to the standards he had expected, and he returned to the laity, married his one and only wife, and worked most of his career for a Volvo dealership. He and his wife are retired in Brick, New Jersey.

Joe Nickell, PhD, is a skeptical cryptozoologist and author of numerous investigative books, including *Tracking the Man-Beasts*.

Searching for the Yowie, the Down Under Bigfoot

Like the fabled Yeti or Abominable Snowman of the Himalaya Mountains, and the Sasquatch/Bigfoot of North America, Australia's Yowie (or Yahoo, among many other names) is a supposed hairy man-beast that leaves strange tracks and wonderment wherever it ambles. Equated with an entity from Aboriginal mythology, also called *Dulagarl* (or *Doolagahl*, "great hairy man"), it was regarded as a magical being from the time of creation—what Aborigines call the Dreamtime. Interestingly, however, "[M]any early Europeans claimed to have seen the Yowie, many years before they came to learn about it from the aborigines" (Gilroy 1976, 9). It remains, according to cryptozoologist Loren Coleman (2006), "one of the world's greatest zoological or anthropological mysteries."

I first went in search of the creature in 2000 guided by skeptic Peter Rodgers. We ventured into the Blue Mountains west of Sydney, which—according to Yowie popularizer Rex Gilroy (1995, 212)—"continues to be a hotbed of Yowie man-beast activities—a vast region of hundreds of square miles containing inaccessible forest regions seldom if ever visited by Europeans." We drove into the Katoomba township bushland and took the world's steepest incline railway (originally built as a coal-mine transport in 1878) down into Jamison Valley rainforest where Gilroy himself once reported an encounter (1976, 10). We next drove to Jenolan Caves—which Gilroy (1995, 219) claims the Aborigines believed to be Yowie lairs—and bushwalked (hiked) through the surrounding mountainous terrain in a vain search for the elusive creature (Nickell 2001, 16–17).

Figure 1. Yowie statue in Yowie Park at Kilcoy, Queensland, Australia (Author's photo).

In 2015, before and after the annual Australian Skeptics National Convention in Brisbane (of which I was honored to be a headliner) held October 16–18, I was able to resume my quest for the Yowie (and began several other investigations). I am indebted to Ross Balch for his tireless help in Brisbane and rural Queensland to the north, and to Kevin Davies and Nick Ware for their dedicated assistance in Canberra and the New South Wales countryside. I photographed a Yowie with a rather wooden personality, did research at an Aboriginal institute, and kept an eye out for any exotic creature in the wild. Here is some of what I found.

Will the Real Yowie . . .

My study began when Ross Balch drove Myles Power and me through scattered Yowie territory to Yowie Park at Kilcoy. There, with parrots flitting about, we took photographs of the cracked wooden sculpture of the fabled man-beast (Figure 1). As I did so I quipped, "It doesn't get more real than this!" I meant that, of course,

to apply to skeptics' sightings: Yowies seem not to appear to skeptics—even those looking for them, although it is obligatory for those who report encounters to insist they were previously skeptical.

But what about the Aboriginal elder who insisted, regarding the *Dulagarl*, "He only appears to Aboriginal people" (Mumbulla 1997)? Do the numerous non-Aboriginal sightings contradict him? Or is it possible he is talking about a quite different being—not the Yowie/Yahoo who today apes (so to speak) Bigfoot, but rather his people's supernatural entity who could induce sleep and fly through the air to kidnap lone women from the bush, yet who—according to some tribal/regional traditions—contrastingly carried clubs, used fire, and ate men. Other creatures of Aboriginal lore included the Quinkins who, variously shaped, were generally quite small; however, the giant Quinkin, Turramulli, towered over tall trees, had three taloned fingers on each hand, and as many clawed toes on each foot (Healy and Cropper 1994, 116, 118; 2006, 6–12). None of these entities sounds like a Bigfoot type.

Indeed, just as Bigfoot was originally a "wild man of the woods" adapted from European tales and retrofitted onto Native American supernatural beings synthesized for the purpose (Nickell 2011; Loxton and Prothero 2013, 30–36), the Yowie/Yahoo is similarly derivative. Australian examples (from "A Catalogue of Cases" 2006) show that the earliest reports—the first in 1789 being acknowledged as "obviously a hoax," and continuing well after the beginning of the twentieth century—were sightings of a "WILD MAN or monstrous GIANT," a "Hairy Man," "in appearance half man, half baboon," "wild man of the bush," "like a blackfellow [Aborigine] only considerably larger," "hairy men," "an old man . . . covered with a thick coat of hair," "the hairy man of the wood," and so on.

As an example, in 1871 a "little girl" reported an encounter that was part of a "wild man" tradition in the area. She described an old man having a bent back, a covering of hair, tremendously long fingernails, and being about the height of her grandfather. He seemed to wish to avoid the girl ("A Catalogue" 2006, 207).

The term *Yowie* appears to have been used little if at all during this period, but the appellation "yourie" or "yowrie" appears by perhaps the 1920s, maybe after the Yowrie River or the nearby crossroads community of Yowrie, named by 1885. There was a Yowie Bay, but it was originally named Ewey Bay after the offspring of ewes called "eweys" (Healy and Cropper 2006, 13–143, 25), so the term *Yowie* may not be aboriginal at all ("A Catalogue" 2006, 217; Healy and Cropper 2006, 14, 25).

Yowie's image may well up from the subconscious and be superimposed on the visual scene.

Yahoos

Moreover, if we consider the earlier, parallel term "Yahoo," we must at once recall that it was used—indeed invented[1]—by English satirist Jonathan Swift in his *Gulliver's Travels* (1726, 343–351). It describes his race of hairy, goat-bearded, manlike animals. Swift's Yahoos are brutes but, satirically, have human depravities.

By 1856 comes a report of a man-beast described alternately as a "wild man of the woods" or a "yahoo." A case of uncertain date in the 1860s involved a twelve-foot-tall Yahoo that had webbed feet and belched fire. In the same decade a Miss Derrincourt encountered "something in the shape of a very tall man, seemingly covered with a coat of hair . . . what the people here call a Yahoo or some such name." Still another case of that period involved an encounter with a "hideous yahoo" near an abandoned village ("A Catalogue" 2006, 204–206).

Graham Joyner (1994) conducted an in-depth study of the issue, which he reported in *Canberra Historical Journal*. He found that Aborigines probably adopted the term *Yahoo* from settlers, rather than the other way around.

'Littlefoot'

In addition to the "hairy giant" tradition, another type of Yowie is represented by the Aborigines' *Junjudees* (among other terms). These are small, hairy, magical creatures comparable to European fairies, elves, and leprechauns. Still, they seem as real as any if we believe the stories of teenagers who encountered them in 1978–1979 on Towers Hill, near Charters Towers, Queensland. One teen was attacked but claimed to have fought off the three-foot-tall creature with a rock (Healy and Cropper 2006, 120–121). Among many other reports were multiple sightings of similar creatures in 1994 in the vicinity of Carnarvon Gorge in Queensland (Pinkney 2003, 31–32).

Some Aborigines emphasize the Junjudees' supernatural powers, telling colorful tales about their exploits. For instance, they are guardian beings of certain places, are mischievous, and are attracted to honey. They are also a sort of bogeyman, used to keep children from wandering off, according to *Australian Folklore* (Ryan 2002, 137–138).

Yowie hunters, somewhat embarrassed by the little hairy folk, rationalize that they may be very young Yowies—no matter what Aborigines say about their "indigenous fairies" (as one researcher calls them [Povah 2006]).

What Manner of Beast?

Yowies are described in a widely diverse manner—beginning with height, which, based on 263 cases ("A Catalogue" 2006), ranges from about two to thirteen feet. The earliest-known record of an

Aboriginal sighting came in July 1871 when a "gorilla"-like creature was encountered, but we must keep in mind that due to their long isolation on the Australian island–continent, the Aborigines had no knowledge of primates other than man. It was the early settlers and journalists who began to describe man-beasts with terms such as "huge monkey or baboon," "upright gorilla," and so on—from 1849 to the present.

In the early 1870s, in New South Wales, prospectors saw what they thought were "hairy men creeping around their tents," but a *Sydney Mail* correspondent concluded, "They were probably the large badgers or wombats which abound there" ("A Catalogue" 2006, 207). Wombats, marsupials that somewhat resemble (according to *American Heritage Dictionary* 1970) "small bears," may well be responsible for a number of other Yowie reports.

The kangaroo and its cousins the wallaby and the wallaroo are also good suspects. When, in 1954, three Queensland youths reported an encounter with a six-foot-tall creature covered with hair, possessing a long tail, and having an "apron" draped from its waist, the latter detail was an obvious clue pointing to a marsupial pouch. Someone suggested that the boys had been scared by "a cranky old wallaroo" ("A Catalogue" 2006, 224). Again, other cases may be explained by such related marsupials.

In addition to animals, there are numerous other possibilities: hoaxes, including those of a diminutive man who wore a hairy suit with bicycle-reflector eyes (Healy and Cropper 2006, 168–169); claims made by persons with fantasy-prone personalities and by ubiquitous attention seekers; real wild men, like a bearded, naked, mentally disturbed man mistaken for a Yowie ("A Catalogue" 2006, 262); and many other possibilities, including simple hallucinations and apparitional experiences. For example, "waking dreams" that occur between wakefulness and sleep (Nickell 2012, 353–354) may explain some cases of persons waking to see a Yowie looking at them (see Healy and Cropper 2006, 105, 170–171, 223). Again, like sightings of ghosts—typically seen when the percipient is tired, performing routine work, daydreaming, or the like—a Yowie's image may well up from the subconscious and be superimposed on the visual scene (Nickell 2012, 345).

'Bigfoot'

The American Sasquatch—after 1958 usually called Bigfoot (Nickell 2011, 68)—no doubt had an influence on Yowie sightings. That is especially so after 1967 when Roger Patterson's famous hoax film greatly publicized that elusive manimal (Nickell 2011, 68–72).

Patterson's "Bigsuit" (a modified gorilla costume) had pendulous breasts, one of several details found in Australian cases occurring (or being reported) only post-Patterson (at least as found in "A Catalogue" 2006). In addition to breasts, these motifs include Bigfoot's legendary foul odor; large, clawless, human-like footprints; and possibly other features (*cf.* Bord and Bord 2006, 215–310).

The Yowie is becoming increasingly standardized in its appearance. It is sometimes said that it resembles "depictions of the American Bigfoot" or that "America's Bigfoot would be an identical type" ("A Catalogue" 2006, 239, 271; *cf.* Nickell 2011, 225–229; 2013).

Even so, people I spoke with generally dismissed the Yowie. In 2000, for example, staffers at the information center at Echo Point in the Blue Mountains (Nickell 2001, 17) insisted the Yowie was only a mythical creature pursued by a few fringe enthusiasts, and this seems to remain the majority view. Several people laughed at my query, and a young bookstore employee in Canberra told me that, although having been born and raised in the Blue Mountains, she had never seen a Yowie or had reason to take the possibility seriously. Still, the wooden statue at Kilcoy stares vacantly on, a little monument to belief. ■

Acknowledgments

In addition to those mentioned in the text, I am grateful to the staff at AIATSIS (Australian Institute of Aboriginal and Torres Straight Islander Studies), Canberra, and CFI Libraries Director Tim Binga. I again want to thank John and Mary Frantz for their generous financial assistance, which makes many of my investigations possible.

Note

1. The invention of the word is credited to Swift in *Gulliver's Travels*, 1726, by the authoritative *Oxford English Dictionary* (1971).

References

American Heritage Dictionary of the English Language. 1970. New York: Houghton-Mifflin Co.

Bord, Janet, and Colin Bord. 2006. *Bigfoot Casebook Updated*. N.p.: Pine Winds Press.

"A Catalogue of Cases 1789 to 2006." 2006. Appendix A of Healy and Cropper 2006, 203–295.

Coleman, Loren. 2006. Introduction to Healy and Cropper 2006, vii–viii.

Gilroy, Rex. 1976. *Psychic Australian*, August, 8–25.

———. 1995. *Mysterious Australia*. Mapleton, QL, Australia: Nexus Publishing.

Healy, Tony, and Paul Cropper. 1994. *Out of the Shadows: Mystery Animals of Australia*. Sydney: Ironbark.

———. 2006. *The Yowie: In Search of Australia's Bigfoot*. San Antonio, TX: Anomalist Books.

Joyner, Graham. 1994. Cited in Healy and Cropper 2006, 12–13.

Loxton, Daniel, and Donald R. Prothero. 2013. *Abominable Science!* New York: Columbia University Press.

Mumbulla, Percy. 1997. Quoted in Healy and Cropper 2006, 12.

Nickell, Joe. 2001. Mysterious Australia. Skeptical Inquirer 25:2 (March/April), 15–18.

———. 2011. *Tracking the Man-Beasts: Sasquatch, Vampires, Zombies, and More*. Amherst, NY: Prometheus Books.

———. 2012. *The Science of Ghosts*. Amherst, NY: Prometheus Books.

———. 2013. Bigfoot lookalikes. Skeptical Inquirer 37(5) (September/October): 12–15.

Oxford English Dictionary. 1971. Compact Edition, New York: Oxford University Press.

Pinkney, John. 2003. *Great Australian Mysteries*. Rowville, Victoria, Australia: The Five Mile Press.

Povah, Frank. 2006. Quoted in Healy and Cropper 2006, 123.

Ryan, J.S. 2002. The necessary other, or "when one needs a monster": The return of the Australian Yowie, *Australian Folklore* 17: 130–142.

Swift, Jonathan. 1726. Reprinted as *Gulliver's Travels into Several Remote Nations of the World*. Boston: Lee & Shepard, 1876.

[NOTES ON A STRANGE WORLD MASSIMO POLIDORO

Massimo Polidoro is an investigator of the paranormal, lecturer, and cofounder and head of CICAP, the Italian skeptics group. His website is at www.massimopolidoro.com.

In Search of Mary Magdalene

Was Mary Magdalene the lover of Christ and did she have a son by him? This idea—made popular by *The Da Vinci Code*, Dan Brown's wildly successful novel and its film adaptation—has stimulated debates, disputes, and even some serious attempts at historical research in recent years. Today, some claim they have found evidence for the fatherhood of Christ in an ancient fresco preserved in a Templar church at Tempio di Ormelle, near Treviso in northern Italy. Is it true?

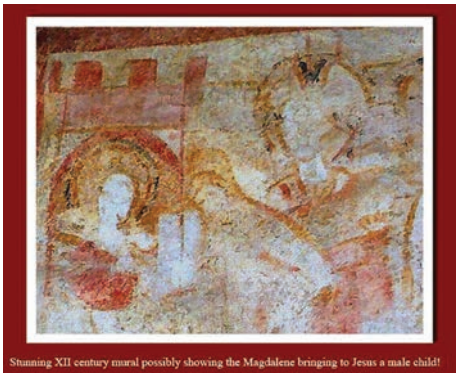
Portrait of a Woman

The figure of Magdalene—a sinner converted by Jesus and turned into one of his most devoted followers—has always stimulated the curiosity and imagination of artists and mystery mongers alike. The hypothesis of her being Jesus Christ's companion was first suggested long before Brown. "It's an idea born in the Parisian 'counterculture' at the end of the nineteenth century, developed by artists that were protesters and often involved in the occult, who wanted to shake up the conventions," Mario Arturo Iannaccone, historian of Christianity, told the author in a personal interview. "For example, in 1888, an opera titled *The Lover of Christ* was performed in Paris. It was written by Darzens and the lover was, obviously, Mary Magdalene. In 1896, a book titled *The Gospel of Mary (Magdalene)* was published; it was an important apocryphal work that helped strengthen feminism. In various novels, Mary Magdalene became a *femme fatale*. Lawrence, author of *Lady Chatterley's Lover*, wrote a story about Mary Magdalene and Jesus titled *The Risen*, filled with double meanings."

But even the 1800s' artists were fascinated by this woman and portrayed her in several paintings. "During the decadent era they turned her into a disturbing character, such as Salomé," continues Iannaccone. "There are many examples in which she is represented as a beautiful woman bejeweled, or naked, symbolizing her newfound innocence. An example is the 'penitent' Magdalenes by Francesco Hayez, painted in 1825 and 1833. But at that time, hundreds of women of high society asked to be portrayed in the nude or seminude *à la Madeleine*, as it was called. They liked to represent this way their youthful beauty and purity."

A Holy Family

Some believe that it was not only decadent and romantic painters who depicted Magdalene, but before them came the painters of the Renaissance and, further back, medieval artists. In these ancient works of art, Magdalene was not merely a disturbing woman; she would be depicted lying on a bed, after giving birth to a child, while Jesus holds a baby in his arms: his son.



The fresco in Tempio Ormelle: Jesus holds a baby, but it is not his son. It actually is a "Dormitio Virginis," or the death of the Virgin Mary, where Jesus, her son, receives her soul in the form of a baby.

Another example of "Dormitio Virginis" by Jacopo Torriti, in Santa Maria Maggiore (Rome), dating back to the end of thirteeth century, like the Tempio Ormelle's fresco.

Another "Dormitio" in which the soul of Mary as a child in diapers can be clearly seen.

Even Italian Nobel laureate Dario Fo, the author of a text devoted to Christ and to Magdalene, thinks that there might be some truth in the case of a not-so-platonic love between Jesus and Mary—a hypothesis that Fo sees confirmed in several famous works: "From the cycle of painting by Giotto in the upper church of Assisi, all devoted to Mary Magdalene, where she ascends to heaven assisted by the angels, well before the Madonna, to a fresco at the Scrovegni Chapel in Padua," said Fo in an interview found on Diego Cuoghi's website. "While portraying Jesus chasing the money changers from the temple, Giotto also paints a little boy who, scared, runs to take refuge near a woman: Mary Magdalene, on whose head stands a halo. That baby, suggests the painter, clings to his mother as if to ask protection from the outburst of a man who had always been seen smiling. His father, Jesus."

On YouTube and in some publications devoted to the occult, it is quite easy to find those who are convinced that they have discovered a twelfth-century fresco depicting a "holy family" composed of Jesus, Mary Magdalene, and their child.

On YouTube and in some publications devoted to the occult, it is quite easy to find those who are convinced that they have discovered a twelfth-century fresco depicting a "holy family" composed of Jesus, Mary Magdalene, and their child.

The fresco in question is located in Tempio Ormelle, on the wall of a medieval church built by the Templar Knights. According to some, the church was dedicated to Mary Magdalene, of whom the Templars were devout, and the fact that in a fresco worn by time, a lady portrayed is actually Mary Magdalene can be deduced from the fact that she wears a red robe, traditionally attributed to her, and by the presence of a tower behind her, her other feature.

Is it really possible, however, that a painting with such outrageous and heretical content could have been painted and its significance remain unnoticed for centuries? If this interpretation were true, it would be really one of the most shocking discoveries in the history of art and, especially, in the history of the Church.

The Templars and Magdalene

The version of Mary Magdalene—who was alternatively seen as the first feminist, sorceress, witch, priestess of a vaguely defined religion of a Mother Goddess—as the true founder of Christianity (or of a Christian alternative) is actually a very modern myth. "It is a reinterpretation of the figure of this woman that was proposed in the late nineteenth century," says Iannaccone. "Since then, Magdalene has been charged with new meanings, becoming a prism that reflects the entire spectrum of modern protesters against traditional Christianity."

The Da Vinci Code had popularized the idea of a Jesus bloodline. "These are modern fantasies often connected to sacred or *graalian* bloodlines," continues Iannaccone. "No serious historian, caring for his own reputation, ever took them seriously, simply because they lack the necessary foundations. More important are the studies of so-called feminist theology, which aim to re-evaluate the role played by women in early Christianity and therefore also that of Magdalene: this is an ideological, historical, and theological area that is both respectable and culturally relevant. Where, however, the modern myth of Magdalene has no place."

Also, in *The Da Vinci Code*, one of the key clues of an intimate relationship between Jesus and Mary Magdalene was sought in the *Last Supper* by Leonardo da Vinci, where an effeminate figure, with long hair, sits at the right hand of Christ.

"This is the apostle John, as any art student knows," noted Diego Cuoghi, expert of art history and author of a study on the issue of Ormelle, in a personal interview with the author. Leonardo himself wrote clearly in his preparatory notes who that figure represented. Cuoghi continues: "Perhaps it will seem trivial, but Christian sacred art is based on the texts of Christian religion. For this reason, in almost all Medieval and Renaissance *Last Supper*s Giovanni is always represented as young, boyish-looking, and with a hairless face, unlike the other apostles who look like adults, often bearded; and he often has the head reclined on the shoulder or chest of Jesus."

If, then, the one painted by Leonardo is not Magdalene, could she be depicted in the fresco at Tempio Ormelle?

Cuoghi says: "First of all, it should be clarified that the color red is not a characteristic exclusive to Mary Magdalene, but belongs also to the Madonna, for example. And the tower is a characteristic iconography of Santa Barbara (who was locked in a tower) and, again, of the Virgin Mary (also called *Turris Davidic* in litanies)."

The iconographic elements that distinguish Magdalene in art, in fact, are different: the jar of ointments in Medieval times, as Mary Magdalene washed the feet of Christ, and the skull, the book, and the crucifix from the sixteenth century onward.

"As for the Templars," continues

Cuoghi, "they never dedicated any church to Mary Magdalene but only to the Virgin Mary, whose cult was passionately widespread by Saint Bernard of Clairvaux, who wrote the rule of the Templars and 'invented' the term 'Notre Dame.'"

Iannaccone agrees: "The Templars were mostly French and the tradition of the repentant prostitute landed in Provence became fixed in the tenth century, giving rise to a lively worship that later extended to all of France. Therefore a number of French Templars was certainly devoted to Saint Mary Magdalene, but in the same way they were of other saints."

A Little Mysterious Fresco

What then does the Tempio Ormelle fresco depict, if the figure lying in bed is not Magdalene? And why does a man (who is certainly Jesus, since he is characterized by a crossed cloud) hold in his arms a newborn baby?

Often, those who venture into this kind of reckless interpretation ignore the entire history of art and interpret the images according to their own personal biases. A famous example of this kind of behavior is that of those who today see flying saucers, aircraft, and ships in Medieval and Renaissance paintings (see this column, SI, March/April 2014 and July/August 2014).

"Do you really think it possible that, in the thirteenth century, a painting with such a subject (Mary Magdalene giving birth to Jesus's son) could be painted on the walls of a church? Do you think that the ecclesiastics who commissioned the work to the artist would not have had anything to say? I do not think so," observes Cuoghi. "Just think of the many paintings that Caravaggio was forced to do all over because they did not meet the standards required or what happened with the *Last Supper* by Veronese, destined to the refectory of the Dominican convent of Saints John and Paul in Venice, where the artist had placed all kind of people, dwarves, acrobats, and animals, as if it were a spectacle at the palace. The painting was refused and the artist tried by the Inquisition."

A closer examination of the painting on the walls of the church of Tempio, then, reveals something quite different.

"This is what is called a *Dormitio Virginis*, or the transit of the Virgin, the final episode of Mary's life as told by some apocryphal accounts but depicted in many works of art until the late fifteenth century, especially in the churches dedicated to her," according to Cuoghi. "This scene depicts the Virgin dying while standing next to her son Jesus, who receives her soul in the form of a baby in diapers. In other versions, Jesus is already in heaven, and brings with him the soul of the Virgin Mary. Beautiful examples of the *Dormitio* can be seen in Rome in the apse mosaics by Pietro Cavallini, in Santa Maria in Trastevere, and in those by Jacopo Torriti in Santa Maria Maggiore, both dating from the late thirteenth century, the same period of the paintings at Tempio Ormelle."

What then does the Tempio Ormelle fresco depict, if the figure lying in bed is not Magdalene? And why does a man (who is certainly Jesus, since he is characterized by a crossed cloud) hold in his arms a newborn baby?

Not surprisingly, on the walls of the same church, dedicated to Our Lady as many of those built by the Templars, the life of Mary is depicted in fresco after fresco. And the cycle ends with the *Dormitio*, or the death and ascension into heaven of the Virgin.

Modernity of Magdalene

And what about the Giotto's frescoes that so surprised Dario Fo? Iannaccone has an answer:

> Leafing through the extensive bibliography of texts written by scholars who have studied the work of this painter, from Toesca and Salvini until Frugoni, Pisani, Wolf, Fornari, one can easily verify that none of them went even close to these "modern" interpretations—precisely because they are modern readings, unhistorical, with no method, which totally ignore the sources. Dario Fo collected the jokes of his son Jacopo, a comedian, who clung, I do not know with how much conviction, to the inventions of Dan Brown. Before the release of *The Da Vinci Code* he never spoke about this.

But why today is there so much discussion about Magdalene? What's so special about this woman to attract the attention of fans of mysteries?

"Magdalene has been presented as a free woman, aware of her charm, who follows Jesus by her own choice," concludes Iannaccone.

> She is a complete female figure, closer to modern sensibilities than, for example, Mary the mother of Jesus or any other women who followed him. She was called "apostle to the apostles" because she was very close to Jesus and because she received, according to the Gospels, the announcement of his Resurrection. Saint Gregory the Great wrote in a sermon that he had converted to holiness after a lifetime of sin. This (historically uncertain) proposal was successful. Two or three figures of women mentioned in the Gospels were merged into a coherent character, the perfect penitent who, however, had experienced everything in life, including free sexuality. ■

[PSYCHIC VIBRATIONS ROBERT SHEAFFER

Sheaffer's "Psychic Vibrations" column has appeared in the Skeptical Inquirer for forty years; its highlights were published as a book (Create Space, 2011). Sheaffer blogs at www.BadUFOs.com, and his website is www.debunker.com.

Missiles and Saucers

A lot of recent UFO sightings and related discussion resolve into pyrotechnic shows created by the world's space programs. On June 29, 2015, at 1:28 AM, a man identified only as C.J. and his wife were driving near Wadley, Georgia, when a "large metallic object with fluid oil slick body spurting sparks from the rear flies dirctly over Our truck" (*sic*). The man, a U.S. Army non-commissioned officer on active duty, reported to the National UFO Reporting Center (NUFORC) that (*sic* throughout):

> At precisely 01:28 AM 29 June 2015 on HWY 1 south heading north approximately 7-8 miles south of a gas station at 10525 HWY 1 south, Wadley, GA, 30477. Our radio began to get real static so I turned it down when my wife noticed a very large object flying left to right coming toward us. I looked up to the left and hit my brakes stopping our truck to the side of the road. The object appeared to be approximately 250 meters in length 60 meters height and was approximately flying 200 feet in altitude and was spurting sparks from the rear of the object. The sparks were jetting out about 50-80 meters in a pattern of controlling thrust.
>
> My wife and I had a very good look at the object closer than anyone else on that highway considering there was no vehicles in sight. The object had a dim glow of orange around it, vague but noticeable. The objects exterior was metallic but appeared to look like oil on water effect to it and appeared to be fluid like movement over the metallic body of the object.
>
> My wife and I watched in disbelief in what we were witnessing as it moved left to right the object decreased in altitude as it was over the highway then began to increase in altitude after it crossed the highway right overhead of us. We watched as it increased in altitude and penetrated some clouds and accelerated out of sight through the cloud cover quickly.

But satellite orbit guru Ted Molczan thought that this sounded like it might be a possible satellite re-entry, and he went to work. He found that the time of the event matched almost perfectly with the known re-entry of 1973-084D / 6939, the final rocket stage of the launch of Cosmos 606. This event was widely witnessed, giving rise to 169 reports in the database of the American Meteor Society. Molczan wrote:

> The witness stated that the sighting was at "precisely 01:28 AM." Based on the trajectory analysis, I doubt they would have spotted the re-entry much before 01:29:30 EDT, when it was near culmination, 34 deg above the NW horizon. I estimate that they would have lost sight of it about 01:30:30 EDT. The time discrepancy is not large. If the witness were to insist that 01:28 is correct, and claim that this proved the re-entry was not their UFO, then he would need to explain how he failed to see the re-entry when it passed a minute or two after the UFO, directly in front of him as he resumed his drive north. The satellite imagery, taken within minutes of the sighting, reveals that the sky was fairly clear.
>
> The reported sighting duration of 4-5 min is quite a bit longer than the 1 min that I estimate the re-entry was in view, but the discrepancy is not unusual for events of this type.

The NUFORC added Molczan's explanation to its listing of this incident. The witness, however, "states unambiguously that he believes that what he witnessed with his family was not a re-entering satellite."

In fact, according to the Crop Circles Research Foundation, this witness "was unconsciously compelled to write down symbols consisting of lines and squares from left to right, on the back of the Motel 6 full page receipt.... It has been independently confirmed both by myself and another researcher (Dr. Horace Drew) that C.J.'s symbols are in fact a message written in binary code that can be translated via a standard ASCII table."

Where have we seen this before? Just recently, proponents of the 1980 Rendlesham Forest incident were making a big fuss over the claims by Sgt. Jim Penniston (ret.) that he telepathically received, and wrote down in his loose-leaf notebook, ASCII binary data from the Rendlesham UFO sent by time travelers (see this column, November/December 2015). C.J. seems to have done much the same thing.

On the evening of October 8, 2015, observers in Saudi Arabia, Iran, and nearby countries saw a spectacular streak of light in the sky surrounded by a glowing cloud. "Video: UFO over Saudi?" shared an October 11, 2015, news story on Emirates 247: "Saudi amateur photographer captured object as it streaked slowly across the skies." Molczan investigated and found that they had seen an engine burn of the Centaur rocket NROL-55, placing a U.S. surveillance satellite payload into its proper orbit.

On November 5, James Oberg reminded us that it was the twenty-fifth anniversary of the greatest mass UFO sighting in French history, on the evening of November 5, 1990 (http://goo.gl/plmsOu). Thousands of observers saw the object, and many sketched it.

Some reported electromagnetic effects on car radios and computers. Molczan and others have shown that this was the re-entry of a Russian Proton rocket (designation 1990-094C), used to launch the Gorizont 23 satellite. Nonetheless, it caused a sensation among UFOlogists, many of whom adamantly refused to accept the obvious explanation. Oberg wrote: "Many witnesses described a solid structure with beacons, jets, contrails, searchlights. . . . Some witnesses reported 'alternating slow and rapid speeds' or a 'vertical ascent.' Civil & military pilots among most spectacular misperceivers. 'This thing was not of this world,' said Capt. Mike D'Alton. 'In all my 23 years of flying I've never seen a craft anything like this.'"

Then on the evening of November 7, 2015, a brilliant light streaking across the sky startled observers throughout California and in neighboring states. This spectacular sight generated a great deal of excitement and sensational headlines about "UFOs" and "aliens." Somewhat belatedly, the U.S. Navy stated that it was a test launch of an unarmed Trident II missile from a submarine. *The Drudge Report* headlined, "Missile California Freakout," while Alan Boyle of NBC News wrote, "Trident Missile launch sparks UFO freakout in Los Angeles and on Twitter." Not surprisingly, many conspiracy-oriented UFOlogists claimed that the U.S. Navy was lying about a missile launch to cover up a genuine UFO. They seem to have forgotten that the U.S. Navy issued a warning five days earlier for all air traffic to avoid this area off the coast until November 15. A second test launch occurred on November 9, but it occurred during the daytime and nobody seems to have noticed it.

I happened to be outdoors at an event in San Diego County and saw the missile climb higher and further downrange (which paradoxically made it appear to be moving lower), leaving behind for several minutes a glowing blue gaseous cloud high enough above the ground to still be illuminated by the sun. Stranger still, in space the cloud keeps moving following the missile. Oberg noted that this "spectacular launch apparition" requires the observer to be in darkness, while the missile must be high enough to be in full sunlight (http://goo.gl/MlZQTm). This rare occasion would occur only about 5 percent of the time during a given twenty-four-hour period.

Many people thought that the missile was quite close to them. One observer at our event posted that the missile must not have reached its destination, as it exploded over our town!

Many people thought that the missile was quite close to them. One observer at our event posted that the missile must not have reached its destination, as it exploded over our town!

Other observers wrote that it was right over their heads (an impossibility, unless they were on the ocean), yet another that it paused and changed direction. But appearances can be deceiving, as the first and second stages of the missile separate and fall away. The dummy warhead arrived at its target in the Kwajalein Atoll in the Marshall Islands, exactly as planned.

A missile scare was repeated on November 17, this time by observers in Siberia. When a huge, glowing, gaseous-looking object was seen in the sky, initial explanations ranged from a "UFO" to an "alien wormhole." But as Oberg explained to Lee Speigel of the *Huffington Post*:

> It was the twelfth test in a bizarre Russian missile program to develop defense-penetrating warheads... The just-launched missile coasts for several minutes and then fires its last stage pushing the warhead downwards into a special radar test range. The plume, then actually higher in the sky, gets to be more than 100 miles long, perhaps 500-600 miles in space before falling back into the atmosphere. Half of the tests have occurred within an hour of sunset. For millions of people along the route, a triangle cloud suddenly appears from nowhere and grows for 60 seconds. Then the nose flares into a brief spiral and fades away. (http://goo.gl/hTNjIk)

And finally, almost missile-related: a new explanation has been offered—where none is needed—for the supposed "UFO crash" near Kecksburg, Pennsylvania, on December 9, 1965. John Ventre is the Pennsylvania state director of the Mutual UFO Network (MUFON) and also appears on MUFON's sensationalist TV show *Hangar 1* on the History Channel (see this column, January/February 2016). Ventre told the *Pittsburgh Post-Gazette* (December 6, 2015) that the object supposedly crashing near Kecksburg was "a General Electric Mark 2 Re-entry Vehicle that had been launched by the Air Force as a spy satellite, but fell out of orbit" (http://goo.gl/hghffu).

However, the Kecksburg "UFO crash" matches exactly in time, direction, etc., with the well-documented Great Lakes Fireball of December 9, 1965 (http://www.debunker.com/Kecksburg.html). It was seen across hundreds of miles from Indiana and Ontario to Pennsylvania. There was an article about it in the February 1966 issue of *Sky and Telescope* magazine. As with other such events, many observers thought that the object was near them, passing right over their town, when it was in fact hundreds of miles away. What an amazing coincidence it would be if Ventre's undocumented crashing satellite just happened to come at the same time traveling in the same direction as the well-documented Great Lakes Fireball meteor (whose orbit has been analyzed and definitely came in from space). The Kecksburg "witnesses" should have seen two amazing objects, the meteor fireball and the crashing satellite, nipping at each other's heels. John Ventre also said that Malaysian Air flight MH-370 was probably abducted by aliens. Yes, UFOlogy *really is* that lame. ■

Matthew Nisbet is associate professor of communication at Northeastern University and a Committee for Skeptical Inquiry scientific consultant. From 1997 to 1999, he was public relations director for CSI.

Shifting the Conversation about Climate Change

Strategies to Build Public Demand for Action

Late last year at the United Nations climate change summit in Paris, world leaders reached a historic accord committing their countries to lowering greenhouse gas emissions over the next two decades and beyond.

The combined commitments by countries fall short of what many scientists say is needed to avoid the worst impacts of climate change, but the Paris accord marks an essential first step. World leaders pledged to revisit their commitments every five years with the goal of ratcheting up efforts to rapidly reduce emissions.

Yet over the next decade, as the United States joins with other countries in a quest to decarbonize the world economy, it will be essential to also ratchet up U.S. public opinion.

The challenge is to move the majority of Americans who remain ambivalent about the issue toward greater support for government action.

Recent studies, including several that I have conducted, suggest a portfolio of related communication strategies that can help shift the conversation about climate change, building public demand for solutions.

Talking Up Consensus

As simple as it might sound, perceptions of scientific consensus on climate change serve as a key "gateway belief," influencing other beliefs about the issue, which in turn shape support for policy action, report Sander van der Linden and colleagues (2015) in a recently published study.

Even for individuals who closely follow the issue, it is impossible to track the latest scientific findings or studies about climate change, much less parse the many complexities involved. Instead, as with medical questions or technology issues, most people use what they perceive as the consensus opinion of relevant experts as a mental short cut.

On the issue of climate change, the problem is that many members of the public are not very good at accurately estimating the true level of scientific consensus.

On the issue of climate change, the problem is that many members of the public are not very good at accurately estimating the true level of scientific consensus. Surveys of climate scientists and comprehensive reviews of thousands of peer-reviewed studies confirm the same basic fact: at least 97 percent of climate scientists say that human-caused climate change is happening (see Doran and Zimmerman 2009; Anderegg et al. 2010; Cook et al. 2013). One study, in fact, indicates the consensus is actually as high as 99.9 percent (Powell 2015). Yet recent surveys find that only one out of ten Americans correctly estimate agreement among climate scientists as greater than 90 percent (Leiserowitz et al. 2014).

To evaluate strategies for correcting perceptions of expert consensus, van der Linden and his colleagues (2014) tested the effects of different variations on the same message: "97% of climate scientists have concluded that human-caused climate change is happening." In one experimental condition, subjects were presented just with the text of the message. In a second condition, the text was paired with a pie chart visually conveying the level of consensus. In other conditions, subjects were presented with variations on a relevant metaphor such as, "If 97% of engineers concluded that a particular bridge is unsafe to cross, would you believe them? 97% of climate scientists have concluded that human-caused climate change is happening."

Across each of their experimental conditions, boosting awareness of scientific consensus increased beliefs that climate change is happening, that it is human caused, and that it is a worrisome problem. These shifts in beliefs in turn increased subjects' support for policy action, with some of the biggest increases observed among Republicans, who tend to be more dismissive of the issue (van der Linden et al. 2015). Interestingly, in comparison to the tested metaphors, subjects who received either

the simple text statement or the pie chart displayed the greatest increase in their beliefs.

Metaphors are especially useful for explaining complex mechanisms related to climate science, reasoned van der Linden and his colleagues (2014), but when trying to convey the strength of scientific consensus, "presenting information in a way that is short, simple, and easy to comprehend and remember seems to offer the highest probability of success for all audiences examined," they concluded.

Reframing the Debate

As we educate the public about scientific consensus, evidence suggests we also need to reframe the focus of debate. Americans tend to view climate change as a scientific or environmental issue, but not as a problem that affects them personally or that connects to issues that they already perceive as important.

Successfully reframing climate change means remaining true to the underlying science of the issue while applying research to tailor messages to different audiences, making the complex issue understandable and personally important (see Nisbet 2009).

For example, in a series of studies conducted with several colleagues, we examined how Americans respond to information about climate change when the issue is framed as a public health problem. A public health focus stresses scientific findings that link climate change to an increase in the incidence of infectious diseases, asthma, allergies, heat stroke, and other health problems, risks that differentially impact children, the elderly, and the poor.

To test the effects of this frame, in an initial study, we conducted in-depth interviews with seventy respondents from twenty-nine states, recruiting subjects from six previously defined audience segments. These segments ranged on a continuum from those individuals deeply alarmed by climate change to those who were deeply dismissive of the problem. Across all six audience segments, when asked to read a short essay that framed climate change in terms of public health, individuals said that the information was both useful and compelling, particularly at the end of the essay when locally focused policy actions were paired with specific benefits to public health (Maibach et al. 2010).

In a follow-up study, we conducted a nationally representative online survey in which respondents from each of the six audience segments were randomly assigned to three different experimental conditions allowing us to evaluate their emotional reactions to strategically framed messages about climate change. In comparison to messages that defined climate change in terms of either the environment or national security, talking about climate change as a public health problem generated greater feelings of hope among subjects. Research suggests that this emotion helps promote greater public involvement and participation on the issue. Among subjects who tended to doubt or dismiss climate change as a problem, the public health focus helped defuse anger in reaction to information about the issue, creating the opportunity for opinion change (Myers et al. 2012).

A public health focus stresses scientific findings that link climate change to an increase in the incidence of infectious diseases, asthma, allergies, heat stroke, and other health problems.

Working with a Diversity of Opinion Leaders

The research on consensus messaging and framing suggest easy-to-adopt talking points and novel lines of emphasis that scientists and other experts can use in face-to-face conversations, presentations, meetings, media interviews, and via social media. Yet to ratchet up public engagement with climate change, scientists and experts will also have to be joined by a variety of opinion leaders from across sectors of society, trusted voices that can influence otherwise difficult-to-reach audiences (see Nisbet and Kotcher 2009).

Studies, for example, have identified TV weathercasters as an especially important community influencer. Local TV broadcasts remain the top news source for a majority of Americans, and most say they watch the local news primarily for the weathercast. Given their training, visibility, reach, and trusted status, weathercasters hold the unique ability to describe how local weather conditions, such as heat waves, drought, or heavy precipitation, may be related to climate change.

Connecting the dots on such events is important. Research shows that when people understand that they have personally experienced the effects of climate change, they are more likely to be concerned about the issue and to support a variety of policy actions (Placky et al. 2015). To date, more than 250 local weathercasters in the United States representing 185 stations and 105 media markets have been recruited to include regular "Climate Matters" segments as part of their broadcasts, using easily adopted visuals that are localized to specific audiences.

A longitudinal study evaluating a pilot program at a local TV station in Columbia, South Carolina, found that after one year of regular Climate Matters segments, viewers of the station's broadcast had developed a more science-based understanding of climate change than viewers of other local news stations (Placky et al. 2015). Pope Francis's recent effort to reframe climate change in terms of religious duty and social justice is another example of the impact that trusted voices can have on public opinion.

Following the release of the pope's encyclical on the subject and his visit to the United States this past year, 17

percent of Americans and 35 percent of Catholics reported that the pope's position on climate change had influenced their views. In comparison to six months prior to the pope's visit, significantly more Americans were likely to say that climate change is a moral issue, a social fairness issue, and a religious issue (Maibach et al. 2015). These findings provide strong evidence that the pope's reframing of climate change had an impact on how the public thinks about the problem, connecting to widely shared values that transcend political differences.

The Need for Compromise

Ratcheting up public support for government action on climate change not only requires a sophisticated, research-based understanding of effective communication approaches but also an acceptance that there are strong limits to what even the best-funded and most carefully planned strategy can accomplish. Research findings evaluating different communication strategies are often messy, complex, and difficult to translate into practice. They are also subject to revision based on new research, changes in the dynamics surrounding an issue, or in applying across policy decisions and social contexts. Moreover, no matter how knowledgeable and adept experts and their partners might be in applying research to their communication efforts, progress on climate change will ultimately require the different sides in the debate to give ground, negotiate, and compromise. In the case of climate change, the major question therefore is whether public demand for action and the openness to compromise will happen too late, preventing society from successfully avoiding the most serious risks. ■

References

Anderegg, W.R., J.W. Prall, J. Harold, et al. 2010. Expert credibility in climate change. *Proceedings of the National Academy of Sciences* 107(27): 12107–12109.

Cook, J., D. Nuccitelli, S.A. Green, et al. 2013. Quantifying the consensus on anthropogenic global warming in the scientific literature. *Environmental Research Letters* 8(2): 024024.

Doran, P.T., and M.K. Zimmerman. 2009. Examining the scientific consensus on climate change. *Eos, Transactions American Geophysical Union* 90(3): 22–23.

Leiserowitz, A., E. Maibach, C. Roser-Renouf, et al. 2014. Climate Change in the American Mind: Americans' Global Warming Beliefs and Attitudes in November 2013. Yale University and George Mason University. Yale Project on Climate Change Communication, New Haven, Conn. Available online at http://www.climatechangecommunication.org/sites/default/files/reports/Climate-Beliefs-November-2013.pdf.

Maibach, E., A. Leiserowitz, C. Roser-Renouf, et al. 2015. The Francis effect: How Pope Francis changed the conversation about climate change. George Mason University Center for Climate Change Communication: Fairfax, VA.

Maibach, E.W., M. Nisbet, P. Baldwin, et al. 2010. Reframing climate change as a public health issue: An exploratory study of public reactions. *BMC Public Health* 10(1): 299.

Myers, T.A., M.C. Nisbet, E.W. Maibach, et al. 2012. A public health frame arouses hopeful emotions about climate change. *Climatic Change* 113(3–4), 1105–1112.

Nisbet, M.C. 2009. Communicating climate change: Why frames matter for public engagement. *Environment: Science and Policy for Sustainable Development* 51(2): 12–23.

Nisbet, M.C., and J.E. Kotcher. 2009. A two-step flow of influence? Opinion-leader campaigns on climate change. *Science Communication* 30(3): 328–54.

Placky, B.W., E. Maibach, J. Witte, et al. 2015. Climate matters: A comprehensive educational resource program for broadcast meteorologists. *Bulletin of the American Meteorological Society* doi:10.1175/BAMS-D-14-00235.1, in press.

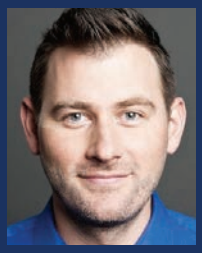
Powell, James Lawrence. 2015. The consensus on anthropogenic global warming. Skeptical Inquirer 39(6): 42–45.

Van der Linden, S.L., A.A. Leiserowitz, G.D. Feinberg, et al. 2014. How to communicate the scientific consensus on climate change: Plain facts, pie charts or metaphors? *Climatic Change* 126(1–2): 255–62.

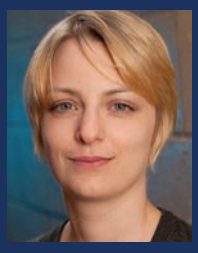
———. 2015. The scientific consensus on climate change as a gateway belief: Experimental evidence. *PloS one* 10(2): e0118489.

POINT OF INQUIRY WITH JOSH ZEPPS & LINDSAY BEYERSTEIN

For in-depth interviews with the most fascinating minds in science, religion, and politics, join *Point of Inquiry* cohosts Lindsay Beyerstein and Josh Zepps at pointofinquiry.org.



Josh Zepps (cohost) is a new media pioneer; a journalist serving as a founding host and producer at the online talk network HuffPost Live, following hosting stints with such outlets as Bloomberg TV, the Discovery Channel, and as an anchor for CBS's Peabody Award-winning *Channel One News*.



Lindsay Beyerstein (cohost) is an award-winning investigative journalist and staff writer for *In These Times*. Her work has appeared in places such as *The New Republic, Reuters, Slate, Salon, Ms. Magazine*, and *The New York Press*. Wait to see what stories she tells with her guests on *Point of Inquiry*.

Stuart Vyse is a psychologist and author of *Believing in Magic: The Psychology of Superstition*, which won the William James Book Award of the American Psychological Association. He is a fellow of the Committee for Skeptical Inquiry.

Guns: Feeling Safe ≠ Being Safe

In the days after the mass shooting in San Bernardino, California, in late 2015, a dear friend who is a single mother made an impassioned plea on her Facebook page. After seeing many calls for increased gun control, she explained that she had been a victim of assault in the past and would not be giving up her handgun anytime soon. She said maintaining her permit was difficult to do—"as it should be"—but she was clearly upset about the many calls for additional controls.

While I sympathize with my friend's desire for security, she has fallen for one of the most common and most dangerous misconceptions Americans hold. According to a 2013 Gallup poll (Swift 2013), the top reason U.S. gun owners keep a firearm is for "personal safety/protection." Fully 60 percent of gun owners gave this reason; the next most common reason was "hunting" at 36 percent.

Sadly, buying a gun does not make you safer. To the contrary, the evidence suggests that bringing a gun into your home *increases* the chances you will be killed. You are to be forgiven if you have not heard more about this. There is an extremely profitable industry based on the myth that guns are an effective means of self-protection, and it would be bad for business if this information were more widely known. Furthermore, the myth that weapons make you safer has benefited from a deliberate campaign against science and the collection of gun violence data.

The Campaign against Gun Violence Research

In 1993, Arthur Kellermann and colleagues published a landmark study in the *New England Journal of Medicine* titled "Gun Ownership as a Risk Factor for Homicide in the Home" (Kellermann et al. 1993). The Kellermann study examined 388 cases of homicide that occurred in the home or within the property borders of the home and an equal number of matched control households. The data were drawn from the most populous counties in three different states (Ohio, Tennessee, and Washington). Kellermann famously found that "keeping a gun in the home is independently associated with an increase in the risk of homicide in the home." Indeed, controlling for other factors, households where a gun was present were 2.7 times more likely to experience a homicide and 77 percent of the victims were killed by someone they knew: a spouse, partner, relative, friend, roommate, or acquaintance.

Kellermann and colleagues concluded:

> Despite the widely held belief that guns are effective for protection, our results suggest that they actually pose a substantial threat to members of the household. People who keep guns in their homes appear to be at greater risk of homicide in the home than people

who do not. Most of this risk is due to a substantially greater risk of homicide at the hands of a family member or intimate acquaintance. We did not find evidence of a protective effect of keeping a gun in the home, even in the small subgroup of cases that involved forced entry. (p. 1090)

The Kellermann study caused quite a stir, and pro-gun advocates were quick to try to criticize it. But the gun lobby was not satisfied with merely trying to debunk the study. The National Rifle Association (NRA) acted to prevent research on gun violence altogether.

The Kellermann study employed telephone and face-to-face interviews, making it very expensive to conduct, and the investigators had received funding from the Center for Disease Control (CDC) and Prevention's National Center for Injury Prevention (NCIP). The NRA response was to advocate for the complete elimination of the NCIP. They failed at that effort, but they were able to effectively block all federal funding of research on gun violence. In what has come to be called the Dickey Amendment—after its author, former U.S. Representative Jay Dickey (R-Arkansas)—Congress placed language in the 1996 omnibus funding bill that prohibited any funds given to the CDC from being used to "advocate or promote gun control." In addition, Congress cut the CDC's budget by $2.6 million, the same amount that had been allocated for firearm injury research in the previous year. The effect of the amendment was chilling, and all federal funding for firearm injury research quickly disappeared, a condition that is still in effect today (Jamieson 2013).

Although federal funding has been cut off for almost two decades, investigators have found other ways to conduct research, and there are some consistent findings.

Former Representative Dickey has subsequently changed his position and is now in favor of the CDC funding gun violence research (Dennis 2015). But last summer Congress quietly renewed the prohibition of firearms research, voting down an amendment that would have lifted the ban. When asked why the CDC amendment was not supported, then-Speaker of the House John Boehner replied, "Because guns are not a disease" (Bertrand 2015).

Again in December of 2015, Congress passed another omnibus spending bill. Despite the efforts of Democrats to eliminate the Dickey amendment, it survived again, and the NRA-backed ban on gun violence research continues (Ferris 2015).

What Does the Available Research Show?

Although federal funding has been cut off for almost two decades, investigators have found other ways to conduct research, and there are some consistent findings.

1. Access to Firearms *Increases* the Risk of Being a Victim of Homicide.

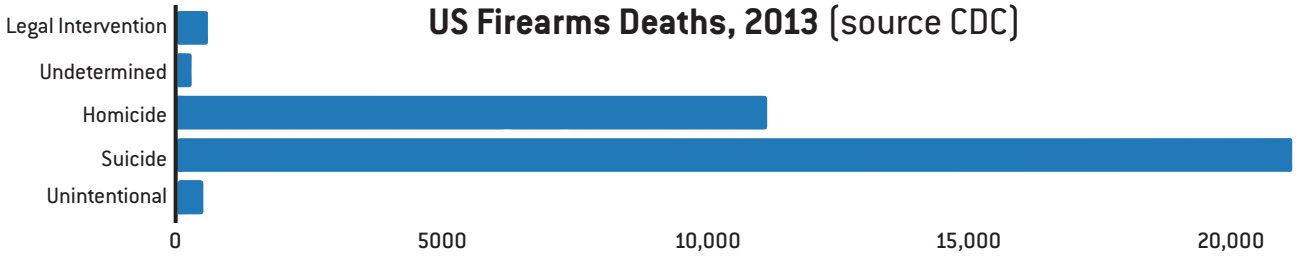
The primary result of the Kellermann study has held up over time. In 2014, researchers from the University of California at San Francisco published a meta-analysis in the *Annals of Internal Medicine*, summarizing all the available controlled studies (Anglemyer et al. 2014). They found the odds of being a victim of homicide were between 1.6 and 3.0 times higher when the victim had access to a firearm. The wide availability of firearms is only one of the factors contributing to the homicide rate in the United States but, contrary to popular belief, you are safer if you don't have a gun at home than if you do.

2. Women Are Especially at Risk of Homicide When a Firearm is Present.

The same 2014 meta-analysis found that the increased risk of homicide victimization created by access to a firearm was significantly greater for women than for men (Anglemyer et al. 2014).

3. Access to Firearms Greatly Increases the Risk of Suicide.

Although it gets far less attention, suicide is a much bigger problem than homicide. According to the National Center for Health Statistics, in 2013 there were 2.5 times as many suicides as homicides in the United States, and many of them were committed using a firearm. Of all firearm deaths, 63 percent were suicides and only 33 percent were homicides. (The other 4 percent are for unintentional [accidents], undetermined, and legal interventions.) Furthermore, 51 percent of all suicides were committed with a firearm (National Center for Health Statistics 2015).



Many suicides are impulsive acts that can often be prevented if there is time. Unfortunately, firearms are quick and highly lethal. Ready access to a gun makes it possible to act on impulse with tragically irreversible results. The 2014 meta-analysis also looked at controlled studies of suicide risk and found that access to a firearm increased the odds of suicide by a ratio of 3.24-to-1 (Anglemyer et al. 2014).

4. Firearms Are Not Very Effective at Deterring Crime.

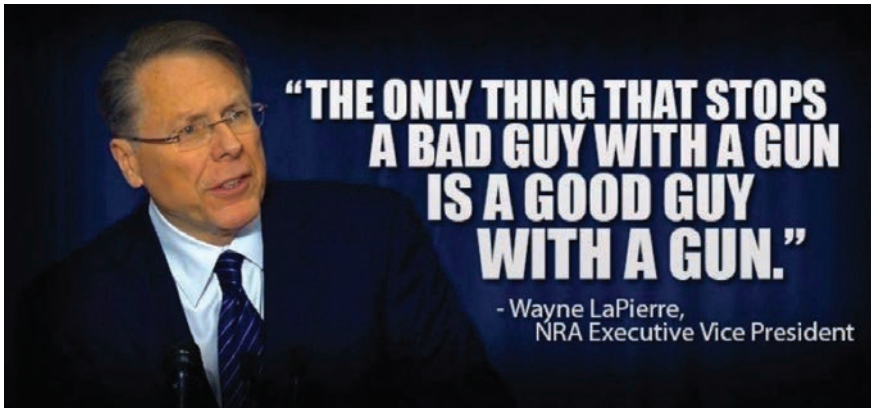
One of the most popular arguments in favor of firearm ownership is that guns are useful for self-defense in criminal encounters. A frequently cited study by Gary Kleck and Marc Gertz (1995) estimated that Americans used guns for self-defense approximately 2.5 million times per year. This figure has been widely criticized, and more recent studies using superior methodologies have painted a very different picture.

For example, in April of 2015 a study published in *Preventive Medicine* by David Hemenway of the Harvard School of Public Health and Sara J. Solnick of the University of Vermont examined data from the National Crime Victimization Surveys for the years 2007 through 2011 (Hemenway and Solnick 2015). Hemenway and Solnick found that out of 14,000 episodes in which the victim came into contact with the offender (robberies, burglaries, assaults, etc.), the victim used a gun to threaten or attack the perpetrator in only 127 cases (0.9 percent). Hemenway and Solnick also found that men and women were equally likely to be the victims of contact crimes, but men were three times more likely to use a gun in self-defense. In over 300 cases of sexual assault, there was not a single incident of self-defense gun use.

For those who used a gun in self-defense, the chances of being injured in the incident (10.9 percent) were essentially equal to those who took no action at all (11.0 percent). There was some evidence that the use of a firearm resulted in less loss of property, but guns were no more effective than other methods of self-defense in this regard.

Dr. Hemenway summarized the findings this way:

> The National Crime Victimization Surveys, the gold standard for crime estimates, indicates that using a gun in self-defense is quite rare (less than 1 percent of contact crime) and that it does not appear to be more effective than many other measures of self-defense or protection in reducing the likelihood of being injured. Not having a gun does not render potential victims of crime either helpless or easy marks.



A Dangerous Myth

In 2012, the U.S. gun industry was estimated to be worth $31.8 billion per year (Velasco 2012). If the recent Gallup poll is an accurate measure of why people purchase guns, a large part of the industry's profits are based on the false belief that owning a gun makes you safer—that a pistol in the drawer will protect you from all the bad guys out in the dark. This is not the first or only industry to profit by spreading false beliefs, but it is hard to

imagine one where the public health costs are as high.

In fact, gun owners would be less likely to be victims of homicide and especially suicide if they got rid of their guns. In addition, taking no action during a criminal encounter would make them no more likely to be injured than if they used a gun.

It is easy to understand the emotional appeal. I am quite certain my gun-owning friend feels safer. Psychological research is replete with examples of how emotion and intuition can lead us astray. When asked what one thing he would eliminate if he had a magic wand, Nobel Prize–winning psychologist Daniel Kahneman said "overconfidence." The kind of overconfidence that makes governments think wars will be easily won and makes investors believe that housing prices will always go up (Shariatmadari and Kahneman 2015).

Many gun owners undoubtedly suffer from overconfidence, too. Thanks to a well-funded advertising campaign, they have a particular image of how a gun would affect any future conflicts in their homes. They have been told that "the only thing that stops a bad guy with a gun is a good guy with a gun." But of course, real life is not a melodrama with easily identifiable good guys and bad guys. Most of the perpetrators of violence are not strangers coming in from the darkness.

It is likely that many gun owners also discount the possibility that they or someone in their home will become suicidal in the future and, as a result, don't consider the implications of having a gun in the drawer when that happens.

It is easy to assume that the negative consequences of gun ownership "would never happen to me." Many gun owners undoubtedly believe they can beat the odds because they are careful and wise, but the evidence is clear. If you care about your safety and the safety of your loved ones, get rid of your guns. ■

Author's Note: This article first appeared on the Skeptical Inquirer website csicop.org on December 16, 2015, and was posted on the magazine's Facebook page the same day. As evidence of America's deeply divided beliefs about guns, the article proceeded to draw heavy comment from readers on both sides of the issue.

Many favorable comments welcomed the application of science to a fraught and highly politicized topic.

Critical comments came in many forms. Some either missed or denied the basic message of the article, such as this comment: "But when you HAVE a gun, you do have some measure of protection for yourself and those around you. Without, you have nothing but laws to keep you safe." Overwhelming evidence contradicts this viewpoint.

Other pro-gun comments were aimed at challenging the studies themselves—a difficult task given the weight and consistency of the findings—or tried to argue that gun controls will not work.

Gun control is a different and far more complicated issue. There is evidence to support the view that homicides and suicides can be reduced by limiting access to firearms, but I will save that more politicalized topic for another day. In this article, I took a more direct approach by addressing a core belief of gun ownership. The majority of gun owners say they buy their guns for protection, when the evidence suggests that they would be better protected by making sure there are no firearms in their homes—by not being gun owners. The belief that guns protect is a false one, and the persistence of that false belief has cost us thousands of lives.

References

Anglemyer, Andrew, Tara Horvath, and George Rutherford. 2014. The accessibility of firearms and risk for suicide and homicide victimization among household members: A systematic review and meta-analysis. *Annals of Internal Medicine* 160(2): 101–110.

Bertrand, Natasha. 2015. Congress quietly renewed a ban on gun-violence research. *Business Insider* (July 7). Available online at www.businessinsider.com/congressional-ban-on-gun-violence-research-rewnewed-2015-7.

Dennis, Brady. 2015. Hours before San Bernardino shooting, doctors urged Congress to lift funding ban on gun violence research. *Washington Post* (December 2). Available online at www.washingtonpost.com/news/to-your-health/wp/2015/12/02/hours-before-san-bernardino-mass-shooting-doctors-were-on-capitol-hill-petitioning-congress-to-lift-ban-on-gun-violence-research/.

Ferris, Sarah. 2015. House Dems lose fight to nix gun research ban in budget. *The Hill* (December 16). Available online at thehill.com/policy/healthcare/263404-house-dems-lose-fight-to-nix-gun-research-ban-in-budget.

Hemenway, David, and Sara J. Solnick. 2015. The epidemiology of self-defense gun use: Evidence from the National Crime Victimization Surveys 2007–2011. *Preventive Medicine* 79: 22–27.

Jamieson, Christine. 2013. Gun violence research: History of the federal funding freeze. *Psychological Science Agenda* (February). Available online at www.apa.org/science/about/psa/2013/02/gun-violence.aspx.

Kellermann, Arthur L., Fredrick P. Rivara, Norman B. Rushforth, et al. 1993. Gun ownership as a risk factor for homicide in the home. *New England Journal of Medicine* 329(15): 1084–1091.

Kleck, G., and M. Gertz. 1995. Armed resistance to crime: The prevalence and nature of self-defense with a gun. *Journal of Criminal Law & Criminology* 86(1): 150–187.

National Center for Health Statistics. 2015. Deaths: Final data for 2013. Available online at www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf.

Shariatmadari, David, and Daniel Kahneman. 2015. What would I eliminate if I had a magic wand? Overconfidence. *The Guardian* (July 18). Available online at www.theguardian.com/books/2015/jul/18/daniel-kahneman-books-interview.

Swift, Art. 2013. Personal safety top reason Americans own guns today. *Gallup.com* (October 28). Available at www.gallup.com/poll/165605/personal-safety-top-reason-americans-own-guns-today.aspx.

Velasco, Shuyler. 2012. US gun industry is thriving. Seven key figures. *Christian Science Monitor* (December 17). Available online at www.csmonitor.com/Business/2012/1217/US-gun-industry-is-thriving.-Seven-key-figures/31.8-billion.

Stuart Vyse is a psychologist and author of *Believing in Magic: The Psychology of Superstition*, which won the William James Book Award of the American Psychological Association. He is also author of *Going Broke: Why Americans Can't Hold on to Their Money*. As an expert on irrational behavior, he is frequently quoted in the press and has made appearances on CNN International, the PBS NewsHour, and NPR's *Science Friday*. He is a fellow of the Committee for Skeptical Inquiry. He can be found on Twitter at @stuartvyse.

[SKEPTICAL INQUIREE BENJAMIN RADFORD

Benjamin Radford is a research fellow at the Committee for Skeptical Inquiry and author or coauthor of seven books, including *Mysterious New Mexico: Miracles, Magic, and Monsters in the Land of Enchantment*.

Cyptozoology and Global Warming

Q: **Could climate change have an impact on unknown creatures, such as the chupacabra or Bigfoot, or lead to more mysterious creature sightings?**

—T. Dokoupil

A: Beginning with the caveat that none of these animals are known to exist, yes. If these creatures are real, they are subject to the same environmental pressures as any other animals, known or unknown.

Beginning with the chupacabra, there are no official Fish and Wildlife data on "weird hairless animals," but I follow all that pretty closely, and from my research those sightings have indeed increased over the past decades. I explained why in my book *Tracking the Chupacabra*:

> Feral dogs and coyotes must feed on something, and the many ranches and farms in Texas provide an obvious food source. Especially with global temperatures increasing, the harsh desert terrain may drive animals to prey on creatures they might not otherwise attack. There's also a biological reason for the prevalence of chupacabra reports in Texas. Mike Bowdenchuck, state director for Texas Wildlife Services, explained why wild animals with severe cases of mange are more common in Texas and the southwest than other rural areas: "Down here, animals don't die of mange, because the temperatures are warm enough. Mange is very common in colder areas, in fact wolves are getting it in Montana right now, and in North Dakota foxes get it. Up there it's fatal, so you never see animals with the severe cases that we see in the southern climates, because they don't live long enough for the mites to get that bad to cause the hair to fall off. They die of hypothermia first." This piece of the puzzle fits perfectly: animals (legendary or otherwise) that have lost their fur would be more vulnerable to the elements, and therefore live longer (and be more likely to be seen) in warmer areas. If this is true, then sightings of animals with advanced stages of mange should be reported more often in northern areas as the climate warms. (Radford 2011, 97)

Thus climate change can indirectly but clearly lead to an increase in monster sightings, particularly of fur-bearing animals such as canids (dogs, coyotes, foxes, wolves, etc.) and raccoons, which look very mysterious when in the advanced stages of sarcoptic mange when their hair falls out. Most animals would die off from the cold due to lack of fur before they became monstrously hairless and unrecognizable, but those animals are living with the disease longer due to global warming. There are at least two "monsters" that this process applies to, the chupacabra and the Montauk Monsters—as well as a handful of other hairless "mysterious" animals found dead across the country.

However, the same issue doesn't really arise in the case of Bigfoot, since we've never found one, dead or alive, hirsute or hairless. One science-based approach to these animal mysteries is to see how real-world events (climate change, tsunamis, volcanic eruptions, etc.) affect known animals and extrapolate that to unknown animals. For example, the 1980 Mt. St. Helens eruption in Washington State—a hotbed of Bigfoot reports—killed thousands of animals yet not a single Bigfoot. This doesn't prove Bigfoot doesn't exist in the area, of course, but it does cast doubt on that assumption. You can certainly make reasonable scientific inferences about how global warming would affect Bigfoot.

In fact in 2009, a team of scientists from the University of Illinois did just

that using modeling programs:

> Ecological niche models (ENMs) and species distribution models have become increasingly popular tools for predicting the geographic ranges of species and have been important for conservation . . . for predicting changes in distribution from past or future climatic events . . . and for investigating patterns of speciation and niche divergence. . . . The basic premise of the ENM approach is to predict the occurrence of species on a landscape from geo-referenced site locality data and sets of spatially explicit environmental data layers that are assumed to correlate with the species' range. (Lozier et al. 2009, 1)

If and when Bigfoot are proven to exist, these questions may be socially important and environmentally relevant, but until then it is rather putting the cart before the unicorn.

Using a dataset including claimed visual and auditory reports, as well as claimed Bigfoot tracks collected between 1944 and 2005 (N=646) as reported by the Bigfoot Field Researchers Organization, the team determined that:

> As expected for montane organisms, the model predicts Bigfoot to abandon lower altitudes and also to lose habitat in coastal regions. However, this loss of habitat should be compensated by a large potential gain in the northern part of the Sasquatch range and in several other montane areas (e.g., Arizona, Nevada, Utah), should such areas remain undisturbed by human activity in the near future. Thus, given our model and available data, we might expect Bigfoot sightings to increase in frequency in northern latitudes and at higher elevations over the coming years. (Lozier et al. 2009, 3)

Though the study data and methodologies were valid—or at least as valid as they can be given an inherently questionable dataset—the authors note that the goal of the paper was not necessarily to determine the parameters of an extant Bigfoot population but "as a tongue-in-cheek response to the increasing prevalence of ENMs in the literature and in papers presented at professional meetings . . . [and] to encourage careful scrutiny of specimen records prior to their use in ENMs" (Lozier et al. 2009, 4). In other words, it's a gentle reminder to colleagues of the importance of valid data in models: garbage in, garbage out.

Ecological niche models aside, we can make reasonable predictions about the effects of global warming on Bigfoot populations. Though Bigfoot and Sasquatch sightings have been reported across North America, from Florida to New Jersey to New Mexico, by far the highest concentration of reports occur in the Pacific Northwest. Under the current climate predictions for North America as projected by the Environmental Protection Agency (2014), the effects of global warming will be most noticeable in the Southeast and Southwest portions of the United States, where the heat waves (five or more consecutive days in which the temperature reaches or exceeds 90 degrees Fahrenheit) are expected to more than double from sixty to 150 or more. However, these are also the areas with the fewest Bigfoot reports; if the animals are indeed more populous in wooded and mountainous areas, the forest and altitude—their typical environment—would help moderate the effects of global warming. The bulk of Bigfoot reports are in the Pacific Northwest where it's fairly cool anyway, especially in the Cascades and Rocky Mountains. If the area gets too warm for Bigfoot, they can simply adapt by moving to higher ground, presumably resulting in a higher concentration of sightings in those areas, just as the ecological niche model suggested. Bigfoot, as a presumably unclothed, poorly sheltered manlike endothermic animal, would not be as affected by global warming as they would by global cooling or a prolonged deep freeze.

Though to the general public Bigfoot is often regarded as merely a mythical mysterious monster (if not a joke), to many believers the creatures are much more than that. They are symbols of free spirits, untouched wilderness, and habitat loss. Concern over the fate of Bigfoot as a presumed species is widespread among believers, with a vigorous and venerable "capture or kill" debate (asking if it's ethical to kill a Bigfoot if it would finally prove to the world that they exist) and periodic attempts to have the mysterious bipedal monsters legally protected and even officially recognized as "indigenous people" (see, for example, Radford 2013).

For many skeptics, discussions about what legal protections Bigfoot does or should have—or how climate change might affect them—is all a parlor game of speculation. If and when Bigfoot are proven to exist, these questions may be socially important and environmentally relevant, but until then it is rather putting the cart before the unicorn. ■

References

Environmental Protection Agency. 2014. Future Climate Change. Updated March 4. Available online at http://www.epa.gov/climatechange/science/future.html.

Lozier, J.D., P. Aniello, and M.J. Hickerson. 2009. Predicting the distribution of Sasquatch in western North America: Anything goes with ecological niche modelling. *Journal of Biogeography* 39(9): 1623–27. Available online at http://www.qc.cuny.edu/Academics/Degrees/DMNS/Faculty%20Documents/Hickerson2.pdf.

Radford, Benjamin. 2011. *Tracking the Chupacabra: The Vampire Beast in Fact, Fiction, and Folklore.* Albuquerque, New Mexico: University of New Mexico Press.

———. 2013. 'Bigfoot DNA' study seeks Yeti rights. Discovery News.com (February 14). Available online at http://news.discovery.com/adventure/bigfoot-dna-study-goal-govt-protection-for-creatures-130214.htm.

BIOLOGICAL RACE AND THE PROBLEM OF HUMAN DIVERSITY

Is biological race a mere myth or a troublesome fact better left unexplored? Some might suggest that, properly conceived, race is neither fable nor farce but rather a potential windfall for both science and society.

KENNETH W. KRAUSE

Some would see any notion of "race" recede unceremoniously into the dustbin of history, taking its ignominious place alongside the likes of phlogiston theory, Ptolemaic geocentricism, or perhaps even the Iron Curtain or Spanish Inquisition. But race endures, in one form or another, despite its obnoxious—though apparently captivating—dossier.

In 1942, anthropologist Ashley Montagu declared biological race "man's most dangerous myth," and, since then, most scientists have consistently agreed (Montagu 1942). Nevertheless, to most Americans in particular, heritable race seems as obvious as the colors of their neighbors' skins and the textures of their hair. So too have a determined minority of researchers always found cause to dissent from the professional consensus.

Here, I recount the latest popular skirmish over the science of race and attempt to reveal a victor, if there be one. Is biological race indeed a mere myth, as the academic majority has asked us to concede for more than seven decades? Is it instead a scandalously inconvenient truth—something we all know exists but, for whatever reasons, prefer not to discuss in polite company? Or is it possible that a far less familiar rendition of biological race could prove not only viable but both scientifically and socially valuable as well?

RACE REVIVED

> *"The productive questions pertain to how races came to be and the extent to which racial variation has significant consequences with respect to function in the modern world."*
>
> *—Vincent Sarich and Frank Miele, 2004*

I have no reason to believe that Nicholas Wade, longtime science editor and journalist, is a racist, if "racist" is to mean believing in the inherent superiority of one human race over any other. In fact, he expressly condemns the idea. But in the more limited and hopefully sober context of the *science* of race, Wade is a veritable maverick. Indeed, his conclusions that biological human races (or subspecies, for these purposes) do exist, and conform generally to ancestral continental regions, appear remarkably more consistent with those of the general public.

In his most recent and certainly controversial book, *A Troublesome Inheritance: Genes, Race and Human History*, Wade immediately acknowledges that the vast majority of both anthropologists and geneticists deny the existence of biological race (Wade 2014). Indeed, "race is a recent human invention," according to the American Anthropological Association (2008), and a mere "social construct," per the American Sociological Association (2003). First to decode the human genome, Craig Venter was also quick to announce during his White House visit in 2000 that "the concept of race has no genetic or scientific basis."

But academics especially are resistant to biological race, or the idea that "human evolution is recent, copious, and regional," Wade contends, because they fear for their careers in left-leaning political atmospheres and because they tend to be "obsessed with intelligence" and paralyzed by the "unlikely" possibility that genetics might one day demonstrate the intellectual superiority of one major race over others.

According to Wade, "social scientists often write as if they believe that culture explains everything and race [indeed, biology] explains nothing, and that all cultures are of equal value." But "the emerging truth," he insists, "is more complicated." Although the author sees individuals as fundamentally similar, "their societies differ greatly in their structure, institutions, and their achievements." Indeed, "contrary to the central belief of multiculturalists, Western culture has achieved far more" than others "because Europeans, probably for reasons of both evolution and history, have been able to create open and innovative societies, starkly different from the default human arrangements of tribalism or autocracy."

Academics especially are **RESISTANT** to biological race, or the idea that 'human evolution is recent, copious, and regional,' Wade contends, because they **FEAR FOR THEIR CAREERS** in left-leaning political atmospheres.

Wade admits that much of his argument is speculative and has yet to be confirmed by hard, genetic evidence. Nevertheless, he argues, "even a small shift in [genetically based] social behavior can generate a very different kind of society," perhaps one where trust and cooperation can extend beyond kin or the tribe—thus facilitating trade, for example, or one emphasizing punishment for nonconformity—thus advancing rule-orientation and isolationism, for instance. "It is reasonable to assume," the author writes, "that if traits like skin color have evolved in a population, the same may be true of its social behavior."

But what profound environmental conditions could possibly have selected for more progressive behavioral

adaptations in some but not all populations? As the climate warmed following the Pleistocene Ice Age, Wade reminds that the agricultural revolution erupted around 10,000 years ago among settlements in the Near East and China. Increased food production led to population explosions, which in turn spurred social stratification, wealth disparities, and more frequent warfare. "Human social behavior," Wade says, "had to adapt to a succession of makeovers as settled tribes developed into chiefdoms, chiefdoms into archaic states, and states into empires."

Meanwhile, other societies transformed far less dramatically. "For lack of good soils, favorable climate, navigable rivers, and population pressures," Wade observes, "Africa south of the Sahara remained largely tribal throughout the historical period, as did Australia, Polynesia, and the circumpolar regions."

Citing economist Gregory Clark (2007), Wade then postulates that, during the period between 1200 and 1800 CE—twenty-four generations and "plenty of time for a significant change in social behavior if the pressure of natural selection were sufficiently intense"—the English in particular evolved a greater tendency toward "bourgeoisification" and at least four traits—nonviolence, literacy, thrift, and patience—thus enabling them to escape the so-called "Malthusian trap," in which agrarian societies never quite learn to produce more than their expanding numbers can consume, and, finally, to lead the world into the Industrial Revolution.

In other words, according to this author, modern industrialized societies have emerged only as a result of two evolved sets of behaviors—initially, those that favor broader trust and contribute to the breakdown of tribalism and, subsequently, those that favor discipline and delayed gratification and lead to increased productivity and wealth. On the other hand, says Wade, sub-Saharan Africans, for example, though well-adapted to their unique environmental circumstances, generally never evolved traits necessary to move beyond tribalism. Only an evolutionary explanation for this disparity, he concludes, can reveal, for instance, why foreign aid to non-modern societies frequently fails and why Western institutions, including democracy and free markets, cannot be readily transferred to (or forced upon) yet pre-industrial cultures.

So how many races have evolved in Wade's estimation? Three major races—Caucasian, East Asian, and African—resulted from an early migration out of Africa some 50,000 years ago, followed by a division between European and Asian populations shortly thereafter. Quoting statistical geneticist Neil Risch, however, Wade adds Pacific Islanders and Native Americans to the list because "population genetic studies have recapitulated the classical definition of races based on continental ancestry" (Risch et al. 2002).

To those who would object that there can be no biological race when so many thousands of people fail to fit neatly into any discrete racial category, Wade responds, "to say there are no precise boundaries between races is like saying there are no square circles." Races, he adds, are merely "way stations" on the evolutionary road toward speciation. Different variations of a species can arise where different populations face different selective challenges, and humans have no special exemption from this process. However, the forces of differentiation can reverse course when, as now, races intermingle due to increased migration, travel, and intermarriage.

RACE REJECTED

> *"It is only tradition and shortsightedness that leads us to think there are multiple distinct oceans."*
>
> *—Guy P. Harrison, 2010*

If we inherit from our parents traits typically associated with race, including skin, hair, and eye color, why do most scientists insist that race is more social construct than biological reality? Are they suffering from an acute case of political correctness, as Wade suggests, or perhaps a misplaced paternalistic desire to deceive the irresponsible and shortsighted masses for the greater good

of humanity? More ignoble things have happened, of course, even within scientific communities. But according to geneticist Daniel J. Fairbanks, the denial of biological race is all about the evidence.

In his new book, *Everyone Is African: How Science Explodes the Myth of Race*, Fairbanks points out that, although large-scale analyses of human DNA have recently unleashed a deluge of detailed genetic information, such analyses have so far failed to reveal discrete genetic boundaries along traditional lines of racial classification (Fairbanks 2015). "What they do reveal," he argues, "are complex and fascinating ancestral backgrounds that mirror known historical immigration, both ancient and modern."

In 1972, Harvard geneticist Richard Lewontin analyzed seventeen different genes among seven groups classified by geographic origin. He famously discovered that subjects within racial groups varied more among themselves than their overall group varied from other groups and concluded that there exists virtually no genetic or taxonomic significance to racial classifications (Lewontin 1972). But Lewontin's word on the subject was by no means the last. Later characterizing his conclusion as "Lewontin's Fallacy," for example, Cambridge geneticist A.W.F. Edwards reminded us how easy it is to predict race simply by inspecting people's genes (Edwards 2003).

So who was right? Both of them were, according to geneticist Lynn Jorde and anthropologist Stephen Wooding. Summarizing several large-scale studies on the topic in 2004, they confirmed Lewontin's finding that about 85–90 percent of all human genetic variation exists *within* continental groups, while only 10–15 percent exists *between* them (Jorde and Wooding 2004). Even so, as Edwards had insisted, they were also able to assign all native European, East Asian, and sub-Saharan African subjects to their continent of origin using DNA alone. In the end, however, Jorde and Wooding showed that geographically intermediate populations—South Indians, for example—did not fit neatly into commonly conceived racial categories. "Ancestry," they concluded, was "a more subtle and complex description" of one's genetic makeup than "race."

Fairbanks concurs. Humans have been highly mobile for thousands of years, he notes. As a result, our biological variation "is complex, overlapping, and more continuous than discrete." When one analyzes DNA from a geographically broad and truly representative sample, the author surmises, "the notion of discrete racial boundaries disappears."

Nor are the genetic signatures of typically conceived racial traits always consistent between populations native to different geographic regions. Consider skin color, for example. We know, of course, that the first *Homo sapiens* inherited dark skin previously evolved in Africa to protect against sun exposure and folate degradation, which negatively affects fetal development. Even today, the ancestral variant of the *MC1R* gene, conferring high skin pigmentation, is carried uniformly among native Africans.

But around 30,000 years ago, Fairbanks notes, long after our species had first ventured out of Africa into the Caucasus region, a new variant appeared. *KITLG* evolved in this population prior to the European-Asian split to reduce pigmentation and facilitate vitamin D absorption in regions of diminished sunlight. Some 15,000 years later, however, another variant, *SLC24A5*, evolved by selective sweep as one group migrated westward into Europe. Extremely rare in other native populations, nearly 100 percent of modern native Europeans carry this variant. On the other hand, as their assorted skin tones demonstrate, African Americans and Caribbean Americans carry two copies of an ancestral variant, two copies of the *SLC24A5* variant, or one of each. Asians, by contrast, developed their own pigment-reducing variants—of the *OCA2* gene, for example—via *convergent* evolution, whereby similar phenotypic traits result independently among different populations due to similar environmental pressures.

So how can biology support the traditional, or "folk," notion of race when the genetic signatures of that notion's most relied upon trait—that is, skin color—are so diverse among populations sharing the same or a similar degree of skin pigmentation? Fairbanks judges the idea utterly bankrupt "in light of the obvious fact that actual variation for skin color in humans does not fall into discrete classes" but rather "ranges from intense to little pigmentation in continuously varying gradations" (Fairbanks 2015).

To Wade, Fairbanks offers the following reply: "Traditional racial classifications constitute an oversimplified way to represent the distribution of genetic variation among the people of the world. Mutations have been creating new DNA variants throughout human history, and the notion that a small proportion of them define human races fails to recognize the complex nature of their distribution" (Fairbanks 2015).

A SEVERE RESPONSE

"I use the term scientific racism to refer to scientists who continue to believe that race is a biological reality."

—Robert Wald Sussman, 2014

Since neither author disputes the absence of completely discrete racial categories, one could argue that part of the battle is really one over mere semantics, if not politics. Regardless, critical aspects of Wade's analysis were quickly and sharply criticized by several well-respected researchers.

The former president of the American Anthropologi-

cal Association and co-drafter of its statement on race, Alan Goodman, for example, argues that Wade's "speculations follow from misunderstandings about most everything, including the idea of race, evolution and gene action, culture and institutions, and most fundamentally, the scientific process" (Goodman 2014). Indeed, he compares Wade's book to the most maligned texts on race ever published, including Madison Grant's 1916 *The Passing of the Great Race*, Arthur Jenson's 1969 paper proposing racial intelligence differences, and Hernstein and Murray's 1994 *The Bell Curve*.

But Wade's "biggest error," according to Goodman, "is his inability to separate the data on human variation from race." He mistakenly assumes, in other words, "that all he sees is due to genes" and that culture means little to nothing. A "mix of mysticism and sociobiology," he continues, Wade's simplistic view of human culture ignores the archaeological and historical fact that cultures are "open systems" that constantly change and interact. And although biological human variation can *sometimes* fall into geographic patterns, Goodman emphasizes, our centuries-long attempt to force all such variation into racial categories has failed miserably.

Although biological human variation can **SOMETIMES** fall into geographic patterns, Goodman emphasizes, our centuries-long attempt to force all such variation into racial categories has **FAILED MISERABLY**.

Characterizing Wade's analysis similarly as a "spectacular failure of logic," population geneticist Jennifer Raff takes special issue with the author's attempt to cluster human genetic variation into five or, really, any given number of races (Raff 2014). To do so, Wade relied in part on a 2002 study featuring a program called Structure, which is used to group people across the globe based on genetic similarities (Rosenberg et al. 2002). And, indeed, when Rosenberg et al. asked Structure to bunch genetic data into five major groups, it produced clusters conforming to the continents.

But, as Raff observes, the program was capable of dividing the data into any number of clusters, up to twenty in this case, depending on the researchers' pre-specified criteria. When asked for six groups, for example, Structure provided an additional "major" cluster, the Kalash of northwestern Pakistan—which Wade arbitrarily, according to Raff, rejected as a racial category. In the end, she concludes, Wade seems to prefer the number five "simply because it matches his pre-conceived notions of what race should be."

Interestingly, when Rosenberg et al. subsequently expanded their dataset to include additional genetic markers for the same population samples, Structure simply rejected the Kalesh and decided instead that one of Wade's five human races, the Native Americans, should be split into two clusters (Rosenberg et al. 2005). In any event, Rosenberg et al. expressly warned in their second paper that Structure's results "should not be taken as evidence of [their] support of any particular concept of 'biological race.'"

Structure was able to generate discrete clusters from a very limited quantity of genetic variation, adds population geneticist Jeremy Yoder, because its results reflect what his colleagues refer to as *isolation-by-distance*, or the fact that populations separated by sufficient geographic expanses will display genetic distinctions even if intimately connected through migration and interbreeding (Yoder 2014). In reality, however, human genetic variation is *clinal*, or gradual in transition between such populations. In simpler terms, people living closer together tend to be more closely related than those living farther apart.

In his review of Wade's *A Troublesome Inheritance*, biological anthropologist Greg Laden admits that human races might have existed in the past and could emerge at some point in the future (Laden 2014). He also concedes that "genes undoubtedly do underlie human behavior in countless ways." Nevertheless, he argues, Wade's "fashionable" hypothesis proposing the genetic underpinnings of racially-based behaviors remains groundless. "There is simply not an accepted list of alleles," Laden writes, "that account for behavioral variation."

Chimpanzees, by contrast, can be divided into genetically-based subspecies (or races). Their genetic diversity has proven much greater than ours, and they demonstrate considerable cultural variation as well. Even so, Laden points out, scientists have so far been unable to sort cultural variation among chimps according to their subspecies. So if biologically-based races cannot explain cultural differences among chimpanzees, despite their superior genetic diversity as a species, why would anyone presume the opposite of humans?

None of which is to imply that every review of Wade has been entirely negative. Conservative journalist Anthony Daniels (a.k.a. Theodore Dalrymple), for example, praises the author lavishly as a "courageous man . . . who dares raise his head above the intellectual parapet" (Daniels 2014). While judging Wade's arguments mostly unconvincing, he nevertheless defends his right to publish them: "That the concept of race has been used to justify the most hideous of crimes should no more inhibit us from examining it dispassionately . . . than the fact

that economic egalitarianism has been used to justify crimes just as hideous. . . ."

Similarly, political scientist and coauthor of *The Bell Curve* Charles Murray warned readers of the social science "orthodoxy's" then-impending attempt to "not just refute" Wade's analysis "but to discredit it utterly—to make people embarrassed to be seen purchasing it in public" (Murray 2014). "It is unhelpful," Murray predicts, "for social scientists and the media to continue to proclaim that 'race is a social construct'" when "the problem facing us down the road is the increasing rate at which the technical literature reports new links between specific genes and specific traits." Although "we don't yet know what the genetically significant racial differences will turn out to be," Murray contends, "we have to expect that they will be many."

Perhaps; perhaps not. But race is clearly problematic from a biological perspective—at least as Wade and many before him have imagined it. Humans do not sort neatly into separate genetic categories or into a handful of continentally-based groups. Nor have we discovered sufficient evidence to suggest that human behaviors match to known patterns of genetic diversity. Nonetheless, because no "is" ever implies an "ought," the cultural past should never define, let alone restrain, the scientific present.

CHARACTERIZING BIOLOGICAL DIVERSITY

"Instead of wasting our time 'refuting' straw-man positions dredged from a distant past or from fiction, we should deal with the strongest contemporary attempts to rehabilitate race that are scientifically respectable and genetically informed."

—Neven Sesardic, 2010

To this somewhat belated point, I have avoided the task of defining "biological race," in large measure because no single definition has achieved widespread acceptance. In any event, the preeminent evolutionary biologist Ernst Mayr once described "geographic race" generally as "an aggregate of phenotypically similar populations of a species inhabiting a geographic subdivision of the range of that species and differing taxonomically from other populations of that species" (Mayr 2002). A "human race," he added, "consists of the descendants of a once-isolated geographic population primarily adapted for the environmental conditions of their original home country."

Sounds much like Wade, so far. But unlike Wade, Mayr firmly rejects any typological, essentialist, or folk approach to human race denying profuse variability and mistaking non-biological attributes—especially those implicating personality and behavior—for racial traits. Accepting culture's profound sway, Mayr warned that it is "generally unwise to assume that every apparent difference . . . has a biological cause." Nonetheless, he concluded, recognizing human races "is only recognizing a biological fact": "Geographic groups of humans, what biologists call races, tend to differ from each other in mean differences and sometimes even in specific single genes. But when it comes to the capacities that are required for the optimal functioning of our society, I am sure that any racial group can be matched by that of some individual in another racial group. This is what population analysis reveals."

So how might one rescue biological race from the present-day miasma of popular imparsimony and professional denialism, perhaps even to the advancement of science and benefit of society? Evolutionary biologist and professor of science philosophy Massimo Pigliucci thinks he has an answer.

So how might one **RESCUE BIOLOGICAL RACE** from the present-day miasma of popular imparsimony and professional denialism, perhaps even to the advancement of science and benefit of society? Evolutionary biologist and professor of science philosophy **MASSIMO PIGLIUCCI** thinks he has an answer.

More than a decade ago, he and colleague Jonathan Kaplan proposed that "the best way of making sense of systematic variation within the human species is likely to rely on the ecotypic conception of biological races" (Pigliucci and Kaplan 2003). Ecotypes, they specify, are "functional-ecological entities" genetically adapted to certain environments and distinguished from one another based on "many or a very few genetic differences." Consistent with clinal variation, ecotypes are not always phylogenetically distinct, and gene flow between them is common. Thus, a single population might consist of many overlapping ecotypes.

All of which is far more descriptive of human evolution than even the otherwise agreeable notion of "ancestry," for example. For Pigliucci and Kaplan, the question of human biological race turns not on whether there exists significant between-population variation *overall*, as Lewontin, for example, suggested, but rather on "whether there is [any] variation in genes associated with significant *adaptive* differences between populations." As such, if we accept an ecotypic description of race, "much of the evidence used to suggest that there are no biologically significant human races is, in fact, irrelevant."

On the other hand, as Pigliucci observed more recently, the ecotypic model implies the failure of folk race as well. First, "the same folk 'race' may have evolved independently several times," as explained above in the context of skin color, "and be characterized by different genetic makeups" (Pigliucci 2013). Second, ecotypes are "only superficially different from each other because they are usually selected for only a relatively small number of traits that are advantageous in certain environments." In other words, the popular notion of the "black race," for example, centers on a scientifically incoherent unit—one "defined by a mishmash of [a] small and superficial set of biological traits ... and a convoluted cultural history" (Pigliucci 2014).

So, while the essentialist and folk concepts of human race can claim "no support in biology," Pigliucci concludes, scientists "should not fall into the trap of claiming that there is no systematic variation within human populations of interest to biology." Consider, for a moment, the context of competitive sports. While the common notion that blacks are better runners than whites is demonstrably false, some evidence does suggest that certain West Africans have a genetic edge as sprinters, and that certain East and North Africans possess an innate advantage as long-distance runners (Harrison 2010). As the ecotypic perspective predicts, the most meaningful biological human races are likely far smaller and more numerous than their baseless essentialist and folk counterparts (Pigliucci and Kaplan 2003).

So, given the concept's exceptionally sordid history, why not abandon *every* notion of human race, including the ecotypic version? Indeed, we might be wise to avoid the term *race* altogether, as Pigliucci and Kaplan acknowledge. But if a pattern of genetic variation is scientifically coherent and meaningful, it will likely prove valuable as well. Further study of ecotypes "could yield insights into our recent evolution," the authors urge, "and perhaps shed increased light onto the history of migrations and gene flow." By contrast, both the failure to replace the folk concept of race and the continued denial of meaningful patterns of human genetic variation have "hampered research into these areas, a situation from which neither biology nor social policy surely benefit." ■

References

American Anthropological Association. 2008. Race Continues to Define America. Available online at http://new.aaanet.org/pdf/upload/Race-Continues-to-Define-America.pdf; accessed November 12, 2015.

American Sociological Association. 2003. The Importance of Collecting Data and Doing Social Scientific Research in Race. Available online at http://www.asanet.org/images/press/docs/pdf/asa_race_statement.pdf; accessed November 12, 2015.

Clark, G. 2007. *A Farewell to Alms: A Brief Economic History of the World*. Princeton, NJ: Princeton University Press.

Daniels, A. 2014. Genetic Disorder. Available online at http://www.newcriterion.com/articleprint.cfm/Genetic-disorder-7903; accessed November 19, 2015.

Edwards, A.W.F. 2003. Human genetic diversity: Lewontin's fallacy. *BioEssays* 25(8):798–801.

Fairbanks, D.J. 2015. *Everyone Is African: How Science Explodes the Myth of Race*. Amherst, NY: Prometheus Books.

Goodman, A. 2014. A Troublesome RacialSmog. Available online at http://www.counterpunch.org/2014/05/23/a-troublesome-racial-smog/print; accessed November 17, 2015.

Harrison, G.P. 2010. *Race and Reality: What Everyone Should Know about Our Biological Diversity*. Amherst, NY: Prometheus Books.

Jorde, L.B. and S.P. Wooding. 2004. Genetic variation, classification and 'race.' *Nature Genetics* 36(11): 528–33.

Laden, G. 2014. A Troubling Tome. Available online at http://www.americanscientist.org/bookshelf/id.16216,content.true,css.print/bookshelf.aspx; accessed November 16, 2015.

Lewontin, R. 1972. The apportionment of human diversity. *Evolutionary Biology* 6: 397.

Mayr, E. 2002. The biology of race and the concept of equality. *Daedalus* 131(1): 89–94.

Montagu, A. 1942. *Man's Most Dangerous Myth: The Fallacy of Race*. NY: Columbia University Press.

Murray, C. 2014. Book Review: 'A Troublesome Inheritance' by Nicholas Wade: A Scientific Revolution Is Under Way—Upending One of Our Reigning Orthodoxies. Available online at http://www.wsj.com/articles/SB10001424052702303380004579521482247869874; accessed November 19, 2015.

Pigliucci, M. 2013. What are we to make of the concept of race? Thoughts of a philosopher-scientist. *Studies in History and Philosophy of Biological and Biomedical Sciences*. 44: 272–77.

———. 2014. On the Biology of Race. Available online at http://www.scientiasalon.wordpress.com/2014/05/29/on-the-biology-of-race/; accessed November 22, 2015.

Pigliucci, M., and J. Kaplan. 2003. On the concept of biological race and its applicability to humans. *Philosophy of Science* 70: 1161–1172.

Raff, J. 2014. Nicholas Wade and Race: Building a Scientific Façade. Available online at http://www.violentmetaphors.com/2014/05/21/nicholas-wade-andrace-building-a-scientific-facade/; accessed November 16, 2015.

Risch, N., E. Burchard, E. Ziv, et al. 2002. Categorization of humans in biomedical research: Genes, race, and disease. *Genome Biology* 3(7): 1–12.

Rosenberg, N., J.K. Pritchard, J.L. Weber, et al. 2002. Genetic structure of human populations. *Science* 298(5602): 2381–2385.

Rosenberg, N., M. Saurabh, S. Ramachandran, et al. 2005. Clines, clusters, and the effect of study design on the inference of human population structure. *PLOS Genetics* 1(6): e70.

Sarich, V., and F. Miele. 2004. *Race: The Reality of Human Differences*. Boulder, CO: Westview Press.

Sesardic, N. 2010. Race: A social deconstruction of a biological concept. *Biological Philosophy* 25: 143–62.

Sussman, R.W. 2014. *The Myth of Race: The Troubling Persistence of an Unscientific Idea*. Cambridge, MA: Harvard University Press.

Wade, N. 2014. *A Troublesome Inheritance: Genes, Race and Human History*. NY: Penguin Press.

Yoder, J. 2014. How *A Troublesome Inheritance* Gets Human Genetics Wrong. Available online at http://www.molecularecologist.com/2014/05/troublesome-inheritance/; accessed November 16, 2015.

Kenneth W. Krause is a former trial and appellate attorney. He is a contributing editor and science columnist for the Skeptical Inquirer and science journalist at https://thedotingskeptic.wordpress.com. He contributes regularly to *Skeptic* and was a contributing editor and books columnist for the *Humanist* as well. Kenneth can be contacted at krausekc@msn.com.

Skepticism and the Nature of the Mind

A more empirically based understanding of the somewhat elusive nature of the mind can help the skeptical community comprehend and influence popular beliefs.

DANIEL A. VOGEL

Writers and readers of the Skeptical Inquirer and of the broader skeptical community spend a great deal of their time critiquing ideas they know to be false—superstitious, supernatural, fundamentalist, metaphysical or religious, conspiratorial, magical, impossible, and irrational. In doing so, however, skeptics may unwittingly advance a view of the mind as a rational agent shining the light of evidence upon the dark shadow of superstition so as to send it scurrying to the closet of once-coveted oddities. Sadly, this is rarely the case, since each human mind stubbornly insists upon an unreason unique to itself but with qualities common to all. In fact, that is why the scientific method constitutes such a precious exercise in discovering often shocking truths that minds alone were typically not able to unearth and which, for many minds, seem to conflict with personal or cultural values.

I argue that the scientific evidence about the functioning of our mentalities suggests that they have so many illusionary qualities of their own that unreason is more fundamental to the human constitution than reason (this does not mean that reason is not important or that we are not capable of reasoning). Humans' need for meaning often competes successfully against a need to secure tangible evidence for and against views that comfort them.

The research of social psychological scientist Jonathan Haidt (2012) has tended to support the idea of David Hume (1739) that our "reason is, and ought only to be the slave of the passions," in contradistinction with the Platonist or Rationalist idea of reason in the control seat. Thus, the research indicates that when we as skeptics look for evidence to demolish another's position, it is because that is something we are each good at doing and science is good at doing. However, we tend to be very poor at demolishing our own ideas, being aware of our own biases, and looking for evidence contradicting our cherished assumptions.

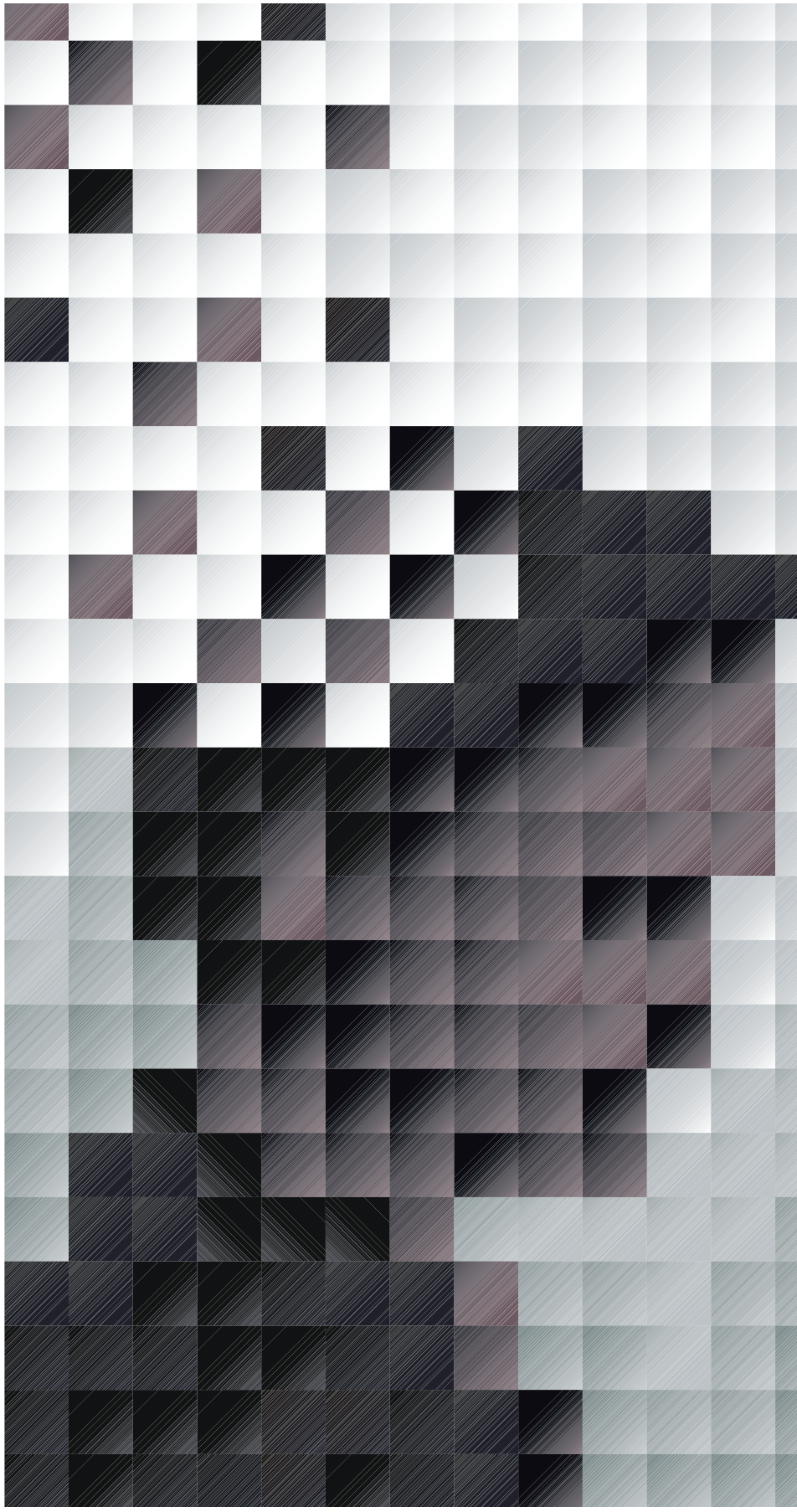
Science is without doubt our best means of discovering the truth. However, we must not forget that truths are also very personal. Many of the truths that we seek to tear apart likely fill a life with meaning. A friend of mine who runs a punk rock label in Chicago fills his shelves with books on supposed ancient truths that have become allegedly suppressed in our modern culture. While they are likely unable to find empirical support, I do notice how they fill my friend's life with a profound sense of magical power, wonder, mystery, and rebellion against a world he views as excessively preoccupied with materialist and consumerist values that seem cold and vacuous to him. As a skeptic, I walk past his library in his home seriously and perhaps a little too prudishly concerned for his welfare, but as a friend I am very aware of the richness this magical thinking brings to his life and of the interesting conversations it inspires in us both. I do not accept any of the myths found within his tomes, but I admit to sharing with

him the hope of a wiser, more moral and philosophical future married in perfect balance with its scientific tradition, as represented by the beloved Vulcan *Star Trek* character Spock.

I begin with the premise that our ability to think is filtered through, and indeed defined by, a delicate array of cortical organs that took millions of years to evolve without any consideration for the later emergence of a sentient central nervous system and thus fashioned less for its advantages as the seat of eventual consciousness so much as for its ability to survive in the wild (Ornstein 1992). Our awareness bears the constant imprint of our limbic emotional response system packed in along with the other realms of our roughly three or four millimeter thin cortex (Ledoux 1998). Thus, as we became not only aware but self-aware, our existential reality increasingly included the filter through which we think; from that moment onward it rendered our perception of the world around us less objectively "real" as we initially imagined, but more as a sort of weird illusion produced by that filter. (Dictionary.com defines "illusion" as "something that deceives by producing a false or misleading impression of reality.") This became one of the fundamental existential realities we henceforth had to accept, or with which we had to cope, beyond those already well established philosophically and empirically (Koole et al. 2006).

In short, "our universe" (meaning the only one we were likely to experience, discuss, describe, or measure) became transformed by our newly perceptive minds into a type of psychological construction of our experiencing, discussing, describing, and measuring, even though it was known to possess an existence of its own separate from our consciousness and even though it followed physical laws our most brilliant minds were to discover. It was after all in the nature of our mind, and not of the wider universe, to experience, discuss, describe, and measure (Gardner 2008).

In our wish to understand our "external" world we developed the scientific method, wondrous proof of our potential to reason, by which to help bypass our neurological filter. Despite centuries of



increasing understanding of ourselves, we remain fundamentally and stubbornly unscientific and persistent slaves to our passions and prejudices (Hume 1739).

Such a resistance to science may originate in children's natural commonsense intuitive thinking, partly the result of their budding neurology and partly that of cultural or parental influence found in societies that most promulgate nonscientific ideologies (Bloom and Weisberg 2007).

While skeptics take the time to demolish the claims of UFO abductions or Uri Geller's bending of spoons, they may not always be self-aware about the ways in which their own minds may be as easily swayed psychologically as those who read the *National Enquirer* (if their fantastical stories seem more bizarre to us than the relatively mundane ones I am about to tell, this may in part reflect our lack of psychological sophistication). When it comes to politics, we are all familiar with its strange circus of acts competing for the seduction of the audience by appealing to its emotional filters rather than to the use of reason. Indeed, today we know that politicians often fail to win over sufficiently large segments of the public if they should insist upon a "dispassionate" view of the mind centered upon facts and evidence to support their positions (Weston 2007). It is surreal that despite our understanding of this political psychology, we fail to integrate this knowledge into our political system the way we would incorporate any other scientific finding into our techniques, whatever they may be (medical, technological, or educational).

With major social ills to be addressed, the findings of psychology fail to permeate the consciousness of activists, actors at all levels of governance, or political movements and parties. This is despite the fact that scientists, having surveyed the scientific landscape by analyzing the science and social science citation indexes of one million articles in more than 7,121 journals, found that the most referenced scientific endeavors—the seven so-called "hub" sciences—included psychology (Boyack et al. 2005).

Governments of the western world are often in gridlock between right/conservative or left/liberal parties despite research findings that the latter are more aroused by and attracted to appetitive images and the former more responsive to aversive motivations. The appetitive represents the move toward the pleasant and life-affirming, and the aversive signifies the defensive move away from the unpleasant and life-threatening. These tendencies likely *both* served important evolutionary functions for all mammals, primarily in underpinning behaviors geared to sustaining life. Thus, the appetitive or hedonistic today may develop political positions advocating increasing spending on the arts and national parks, while the aversive may be more likely to advocate moral purity, harsh treatment for norm violators, and as a result support increasing defense spending, barriers to immigration, or tougher laws for criminals (Dodd et al. 2012). Social debate has been seemingly immune to these empirical findings, which would seem to highlight the value that each position might bring to the complementary table. Both right and left of center voters tend to view the opposing perspective as bizarre.

While skeptics take the time to demolish the claims of UFO abductions or Uri Geller's bending of spoons, they may not always be self-aware about the ways in which their own minds may be as easily swayed psychologically as those who read the *National Enquirer*.

Six core moral foundations are hypothesized to have assisted human evolution and cultural adaptation and to underpin the political positions of the liberal/left and conservative/right in varying degrees (Haidt 2012). Care/harm was found empirically to be the foundation most associated with the liberal/left, with its emphasis upon concern for those who have been exploited or maligned, and upon advocating for them or providing them with a means to level the playing field. To some degree, the liberal also endorses two other moral foundations, namely liberty/oppression (characterizing others or ideas in terms of whether subjects are tyrannized) and fairness/cheating or proportionality (treating others in proportion to their actions). The following three tend to be rarely adopted by the liberal but are more stringently stressed by the conservative: loyalty/betrayal (feelings of loyalty to your in-group, your family, your nation); authority/subversion (honoring tradition and legitimate authority); and sanctity/degradation or purity (avoiding actions that invoke disgust). Interestingly, some research (Haidt 2012) found that the conservative tended to stress all six equally.

Also in the political sphere, another study has shown that well-known psychological biases are at play in undermining environmental action (Mariconti 2009). One such bias is the distinct manner in which we respond to highly personal concerns in contradistinction to those experienced as more distant, peripheral, remote, and abstract. For example, a worry about being mugged may elicit an image sufficiently powerful as to create a surge of fear that may send you scurrying to the other side of the road should someone be walking ahead on an otherwise empty or darkened road. This is referred to as experience-based processing, a reaction that more remote phenomena such as climate change, islands of plastic twice the size of Texas floating in our ocean, the death of coral reef, or the poisoning of the fish we eat do

not evoke in most of us.

Our consciousness is precarious, characterized by chronic vulnerability and impermanence. Many of us totter on with our minds more or less intact, often without awareness of the numerous periods along the way in which, during illness or stress, we regressed to psychological dimensions dominated by emotion and distorted thinking.

At present in the United States, 43.7 million adults or 18.6 percent of the adult population, and 20 percent of the child population, are struck by a mental imbalance of some kind (Substance Abuse and Mental Health Services Administration 2013).

Besides those mental health crises, there is the additional fact that we all dream for five to twenty minutes several times a night; 95 percent of the dreams are forgotten because the frontal lobes that play a part in memory formation are inactive during REM sleep; 80 percent of our dreams are in color; half of all dreamers report occasional lucid dreams in which they are aware that they are dreaming, fully conscious of the unconscious world they are at that time inhabiting. Thus, in a typical lifetime, we dream for a total period adding up to six years (Robbins 2005).

Beyond mental illness and dreams, we all spend periods of our waking lives lost in fantasy and daydreams (Klinger 1990). That we as skeptics do not later tend to brush off our "real" experiences as "pure fantasy" says more about our limited metaconsciousness (consciousness of consciousness) than it does about our expanded ability to separate "fact" from "fiction."

Consider also that even time itself is experienced differently by different states of mind (Ornstein 1997). Some scientists feel time's objective existence is validated by entropy (the universe's decay) or have woven time and space together to form space-time, a continuum or manifold that explains the behaviors of all objects at especially the smallest and largest scales. Other scientists consider time itself an illusion (Davies 2002).

The perception of time is as illusionary as the mind itself may be deemed to be governed by such phenomena as the false belief that recent events occurred further back in time than they did. Vierordt's law stipulates that we tend to overestimate the temporal length of short intervals and underestimate that of longer ones. Also, the amount of motivation we apply to a task shortens the perception of time spent on it, and the intensity of our emotions slows down the perception of time. There are many other experiences that bend time in as facilely a trick on our perceptions as Geller bending spoons (Grondin 2008).

An additional aspect of our seemingly chimerical existence is our failure to experience our own tendency to dissociate (the barring of major sources of emotional or mental experience from awareness). We go about our lives as though we were fully rational and not frequently embedded in our illusionary proclivities. Some studies (Sharps et al. 2006, 2007, 2010, 2014; Rudski and Edwards 2007) have demonstrated the illusion-promoting nature of subclinical dissociation, meaning dissociation not at the level of an emotional disorder (for example not as acute as those with a history of trauma). Such relatively common dissociation at a subclinical level makes it more likely that people will unquestioningly accept their supernatural or magical beliefs. This is in part the result of such dissociation's contribution in strengthening their perspective as opposed to thinking critically at the level of the unexamined details that compose it and that would typically weaken the hold the belief may have. This understanding of subclinical dissociation has been applied to many realms of human endeavor, including beliefs in the paranormal, errors in eyewitness memory, and information processing in general.

I hope my fellow skeptics appreciate the many follies that people believe in as understandable phenomena in light of the fragile, unreasonable, and even somewhat deceptive nature of the mind itself. And I do not imply that these follies must necessarily go unchallenged. Certainly such an appreciation of my fellow skeptics' own unreasonable tendencies would, I think, diminish the unlikelihood of skepticism itself becoming another fundamentalism and would heighten the empathy we of the scientific tradition should have for the inanities that we all easily fall prey to. This is especially so when they serve our need for meaning, which is known to be a fundamental drive of the mind (Koole et al. 2006), more important than happiness itself (Baumeister et al. 2013).

Many of us totter on with our minds more or less intact, often without awareness of the numerous periods along the way in which, during illness or stress, we regressed to psychological dimensions dominated by emotion and distorted thinking.

I believe that consciousness itself possesses both illusionary and dimensional qualities; by illusionary I mean that what we view as our world is such a product of neurological and cultural processes that while it is obviously "real," it is more "real" in the sense to which humans experience their reality. By dimensional I mean that while our thoughts are inexorably products of a physical brain, they do not conform *as thoughts* as readily as do other features of our universe to traditional physical laws nor to the three dimensions of space and one of time.

As an illustration, consider how our most beautiful world is colorful

Human consciousness is our most defining quality, and I humbly advance the suggestion that awareness of its illusionary and dimensional natures alters the nature of the world that we had previously known: what we make of it, how we understand it, how we interact with it.

only because of how rods and cones in our eyes convey information about the wavelength of light to our occipital lobe that produces the color and the vision most of us enjoy. In an alien species, the light's wavelength could just as well be reproduced as sound, as pain, or not at all. The sound we make use of for speech and music is similarly a product of how our physiology translates vibrations of air and matter. The universe is not *itself* of color or sound. Essentially, the world we all take for granted—as filtered through our feelings, neurology, language, culture, personalities, and biases—is a fundamentally human world rather than a fundamentally "true" world. Thus, the *mental experience itself* is, in my own view, a unique dimension (meaning a unique facet of reality) within which we reside mentally and within which we seek out the truth.

Human consciousness is our most defining quality, and I humbly advance the suggestion that awareness of its illusionary and dimensional natures alters the nature of the world that we had previously known: what we make of it, how we understand it, how we interact with it. The more we understand (as psychology develops and becomes more integrated into human processes and life) about this mental universe we find ourselves in, which I propose is a unique existential given we must accept in addition to the others we are more familiar with (such as death, meaning, isolation, choice-making), the more we may view ourselves as beings of consciousness.

A deeper understanding of our psychological natures, one that more closely reflects what science teaches us about our minds, should allow skeptics to carve out our primary task of seeking truth with greater humility but also with greater success, since empathy and a very human understanding of the follies our strange minds are capable of slipping into will enhance our abilities to reach others holding different perspectives more effectively. ■

References

Baumeister, R.F., K.D. Vohs, J.L. Aaker, et al. 2013. Some key differences between a happy life and a meaningful life. *Journal of Positive Psychology* 8:505–516.

Bloom, P., and D. Weisberg. 2007. Childhood origins of adult resistance to science. *Science* 316: 996–997.

Boyack, K., R. Klavans, and K. Börner. 2005. Mapping the backbone of science. *Scientometrics* 643: 351–374.

Davies, P. 2002. That mysterious flow. *Scientific American* 2873: 40–47.

Dodd, M., A. Balzer, C. Jacobs, et al. 2012. The political left rolls with the good and the political right confronts the bad: Connecting physiology and cognition to preferences. *Philosophical Transactions of the Royal Society B* 367: 640–649.

Gardner, H. 2008. *The Mind's New Science: A History of the Cognitive Revolution.* New York: Basic Books.

Grondin, S. (Ed). 2008. *Psychology of Time.* Bingley, United Kingdom: Emerald Group Publishing.

Haidt, J. 2012. *The Righteous Mind: Why Good People Are Divided by Politics and Religion.* New York: Pantheon.

Hume, D. 1739. *A Treatise of Human Nature.* London: John Noon.

Klinger, E. 1990. *Daydreaming.* Los Angeles: Tarcher.

Koole, S., J. Greenberg, and T. Pyszczynski. 2006. Introducing science to the psychology of the soul. *Current Directions in Psychological Science* 15(5): 212–216.

Ledoux, J. 1998. *The Emotional Brain: The Mysterious Underpinnings of Emotional Life.* New York: Simon and Schuster.

Mariconti, C. 2009. Understanding the disconnect on global warming: Research on risk sheds light on environmental inaction. *Observer* 22(2): 16–19.

Ornstein, R. 1992. *The Evolution of Consciousness: The Origins of the Way We Think*. New York: Simon and Schuster.

———. 1997. *On the Experience of Time.* New York: Westview Press.

Robbins, P.R. 2005. *Psychology of Dreams.* Jefferson, North Carolina: McFarland and Company.

Rudski, J., and A. Edwards. 2007. Malinowski goes to college: Factors influencing students' use of ritual and superstition. *Journal of General Psychology.* 134: 389–403.

Sharps, M., J. Matthew, and J. Asten. 2006. Cognition and belief in paranormal phenomena: Gestalt/feature-intensive processing theory and tendencies toward ADHD, depression and dissociation. *Journal of Psychology.* 1406: 579–590.

Sharps, M., A. Hess, and B. Ranes. 2007. Mindless decision-making and environmental issues: Gestalt/feature-intensive processing and contextual reasoning in environmental decisions. *Journal of Psychology* 1415: 525–537.

Sharps, M., E. Newborg, S. Van Arsdall, et al. 2010. Paranormal encounters as eyewitness phenomena: Psychological determinants of atypical perceptual interpretations. *Current Psychology* 29: 320–327.

Sharps, M.J., W.L. Schuyler, and M.R. Herrera. 2014. Remembrance of apocalypse past: The psychology of true believers when nothing happens. Skeptical Inquirer 38(6): 54–58.

Substance Abuse and Mental Health Services Administration. 2013. *Results From the 2012 National Survey on Drug Use and Health: Mental Health Findings.* HHS Publication No. SMA 13–4805. Rockville, Maryland: Substance Abuse and Mental Health Services Administration.

Weston, D. 2007. *The Political Brain: The Role of Emotion in Deciding the Fate of the Nation.* New York: Public Affairs.

Daniel Vogel works as a clinical psychologist in a health care facility in Chicago, serving the seriously ill and dying. He maintains an intimate proximity with family, books, and a variety of musical instruments.

The Mote in Thy Brother's Eye

People suffer from an illusion of objectivity—detecting biases in others that they don't see in themselves. Understanding this bias can lead us to appreciate that those who disagree with us may not be as mad as they might seem.

THOMAS GILOVICH and LEE ROSS

One of the most consequential Supreme Court actions in recent U.S. history was its 2000 decision in Bush v. Gore. (Imagine how differently the United States might have reacted to the September 11, 2001, attacks on the World Trade Center if Gore had been president rather than Bush—no invasion of Iraq; almost certainly a speedier and more determined effort to wean the United States from dependence on oil from the Middle East; and a greater priority given to the development of renewable energy sources to curb climate change.)

The decision blocked a recount of ballots in the exceptionally close race in Florida, handing the presidency to George W. Bush. Critics were quick to note that the 5–4 decision split perfectly along the Court's conservative-liberal lines. Many were outraged that the majority justices were suddenly willing to insert federal authority in this case despite their frequently expressed reservations about judicial activism and their advocacy of states' rights and a narrow interpretation of the equal protection clause. As one legal scholar observed, "I do not know a single person who believes that if the parties were reversed, if Gore were challenging a recount ordered by a Republican Florida Supreme Court…[the majority] would have reached for a startling and innovative principle of constitutional law to hand Gore the victory" (Stone 2001).

While most Democrats thought the majority's decision was tainted by ideological and motivational bias, the five justices behind that opinion insisted otherwise. They maintained that they were applying the law in an even-handed fashion. Justice Clarence Thomas told a group of students in Washington, D.C., that the decision was not in any way influenced by partisanship (Balkin 2001). Justice Antonin Scalia has been even more dismissive of any such claim, telling an audience at Wesleyan University to "get over it" ("Scalia: Get over it" 2012). Conservative pundits, it should be noted, agreed with Scalia and Thomas and, we suspect, would contend that it was the four dissenting liberal justices whose opinions in the case had been influenced by their political leanings.

REUTERS/Larry Downing

Supporters of U.S. Vice President Al Gore and Texas Governor George W. Bush face off against one another December 11, 2000, in front of the U. S. Supreme Court

Although the majority's decision might seem remarkable and, depending on your political allegiances, perhaps even bizarre, the conservative justices' response to the accusation of bias is anything but. People rarely think they are biased. As easy as it is to see when other people are biased, it's hard to see when we ourselves are. In short, we're no different from the majority in Bush v. Gore. Psychologists refer to this as the "bias blindspot." The gospel of Matthew 7:3 in the King James Bible captures the phenomenon with the pointed question, "Why beholdest thou the mote that is in thy brother's eye but considerest not the beam that is in thine own eye?"

It's not simply that we're blind to our own biases because we're defensive or want to think well of ourselves. Those motives exist, but they are not the whole story. The deeper problem is that when we introspect about why we think or feel the way we do, we find no phenomenological trace of self-interested bias. We experience our thoughts and feelings as direct consequences of the pertinent facts—as mandated by the merits of the relevant arguments. We end up convinced that even though our conclusions are in accord with our self-interest or the best interests of our group, self-interest played little if any role in how we evaluated the evidence. We insist that it *just happens* that the most objective conclusion is one that serves us (and people like us) best.

Stated differently, we look inward when contemplating whether our own judgments are biased, and that inward search generally yields nothing. Most of our biases are the product of automatic processes that leave no telltale stains or odors. But when considering whether someone else is biased, we can't look inside that person's head. Instead, we note what the person said or did and consider the prevailing incentives that might have produced those statements or actions. By that analysis, it's quite easy to see evidence of apparent bias in others.

The conviction that we see and experience things as they are, and that when others respond differently it is *their* responses that need to be explained, is not restricted to political assessments. As the great comedian and social commentator George Carlin wryly observed, we tend to feel that those driving faster than us are "maniacs" and those driving slower are "idiots." The same illusion of personal objectivity is apparent when different generations consider their own musical or sartorial preferences and those of their elders or the younger generation. It also rears its head when someone asks if the thermostat can be turned up because "it's cold in here" when we feel perfectly comfortable. The immediate reaction is typically to wonder what is it about *them* that is making them uncomfortable in an environment that feels so obviously satisfactory.

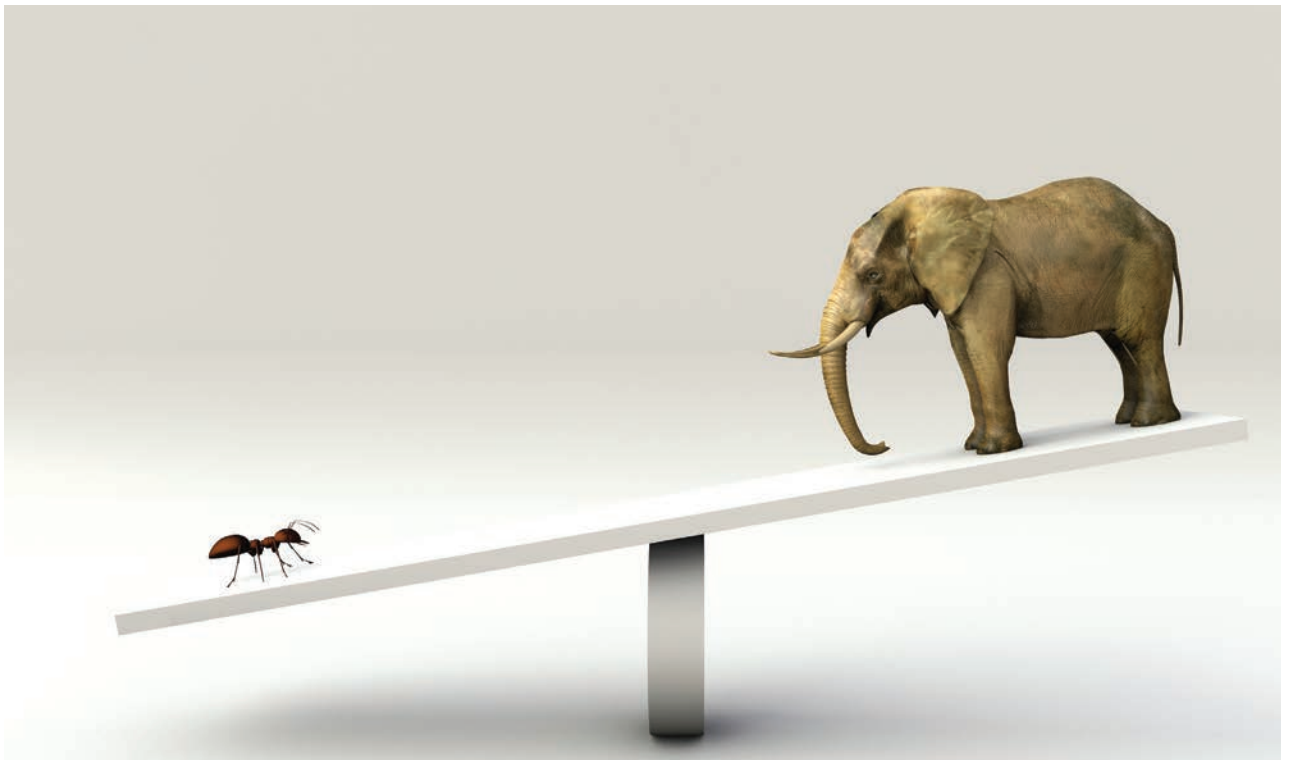
The deeper problem is that when we introspect about why we think or feel the way we do, we find no phenomenological trace of self-interested bias.

But of course it is in the political realm where such reactions are most consequential—when citizens disagree about gun laws, abortion policies, or the urgency of particular social problems and challenges. In these cases, each side is inclined to assume that it is the *other's* stance that needs explaining. It is the other side, opposing partisans insist, whose views reflect the influence of ideology, propaganda, and wishful thinking rather than sound reasoning and attention to the pertinent facts. This asymmetry, furthermore, is most likely to become a source of conflict and mistrust when the issue in question pits the interests of one group against those of another.

This asymmetry was laid bare by a study the two of us conducted with one of our former students, Joyce Ehrlinger (Ehrlinger et al. 2005). We told a sample of Cornell students that the university was in the process of reviewing its affirmative action policies and, as part of that review effort, had assembled a student committee to provide input on any proposed changes. Each respondent was then asked to evaluate the extent to which a Caucasian or minority student's input to the committee would likely be biased versus enlightened by his or her ethnicity. They did so by checking the appropriate point on a continuum between "student's ethnicity likely to detract from his or her ability to see the issues clearly" and "student's ethnicity likely to enhance his or her ability to see the issues clearly."

The results were straightforward and telling. Both minority and Caucasian respondents claimed that the other group's race would get in the way of the ability to see the issues clearly. But neither group acknowledged that their own racial heritage would bias their judgment. In fact, the minority students thought that their own racial identity and experience—as well as those of their friends, family, and forerunners—were an essential source of insight into the issues at hand.

This same pattern was found



when we asked varsity and intramural athletes about a less emotionally charged issue—whether a new workout facility should be available to varsity athletes only or to the entire campus community. Both groups insisted that the other group's views were more biased by self-interest than their own, and that their own status (as a varsity athlete or not) gave them a perspective that was especially informative. So it is not just that people tend to think they are less influenced by bias than others. They are also inclined to think that the lenses through which other people see the world are a source of distortion and the lenses through which they see it are a source of enlightenment.

Thus, former Vice President Dick Cheney no doubt attributes his uncharacteristically tolerant views about gay rights to the insight he has been able to achieve by having a lesbian daughter. But his conservative critics are certain that his views would be less wrong-headed if not for this personal connection to the issue, and they wonder why he is not able to recognize this obvious source of bias. Meanwhile, his (more numerous) critics on the Left wonder why his tolerance on this issue doesn't extend to other groups that suffer discrimination.

Similarly, liberals question whether Nancy Reagan would have been such an outspoken advocate of government support for stem cell research if her husband hadn't suffered from Alzheimer's disease. Why doesn't she see, they wonder, that her stance is at odds with her husband's oft-repeated jibe that "the nine most terrifying words in the English language are, 'I'm from the government and I'm here to help.'" Liberals also find it odd that Sarah Palin would campaign on a platform that emphasized reduced government spending while championing increased federal spending on programs for disabled children—until they realize that she herself has a disabled child. The same could be said of the views of the conservative who has spent a night in prison, or the leftist who has been mugged or harassed by Board of Health inspectors when trying to open a restaurant.

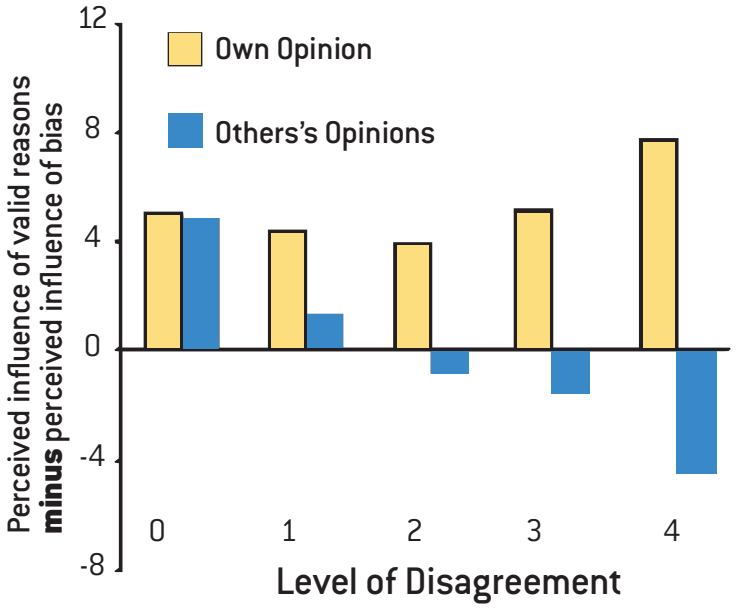
If we see our own judgments as free of bias—as not tainted by our expectations, preferences, or overarching ideology but informed by our personal experiences—it is but a short step to seeing alternative views as the product of hearts and minds that are somehow defective or limited by a lack of reflection and relevant real world experience. In short, other people's judgments are biased *because* they are different from our own. As the distinguished British philosopher Isaiah Berlin wrote as he reflected on the bitter lessons of the twentieth century:

> Few things have done more harm than the belief on the part of individuals or groups (or tribes or states or nations or churches) that he or she or they are in sole possession of the truth, especially about how to live, what to be and do—that those who differ from them are not merely mistaken, but wicked or mad: and need restraining or suppressing. It is terrible and dangerous arrogance to believe that you alone are right, have a magical eye which sees the truth, and that others cannot be right if they disagree. (Berlin 2001)

People are likely to claim bias on the part of others when the gap between their own views and those of someone who disagrees with them is most pronounced. This was very clearly demonstrated in a simple study the two of us conducted with Prince-

ton psychologist Emily Pronin (Pronin et al. 2004). We asked a large sample of research participants to first fill out a survey indicating their positions on various issues such as affirmative action, capital punishment, and abortion rights, and how much they approved of various prominent political figures and media sources. We then collected these surveys and redistributed them at random to other participants. Next, we asked the participants to rate how similar the views of the person whose questionnaire they had received were to their own views. Finally, we asked them to assess the extent to which they felt that that person's views, as well as their own views, reflected various "considerations." Some of the considerations listed were ones that are generally regarded as reasonable and valid, such as "attention to fact," "concern with justice," and appropriate attention to "long-term consequences." Others specified particular biases such as "desire for peer approval," "wishful thinking," and "political correctness."

The results, depicted in the accompanying figure, were clear and dramatic. They also provide some perspective when we see liberals rant about the views expressed on Fox News, or conservatives complaining about what they see and hear on CNN (to say nothing of what they would see and hear on more liberal media outlets). We found that the more the other person's views differed from the respondents' own, the more they were chalked up to bias rather than rational considerations (the shaded bars). Tellingly, the level of disagreement did not much influence the degree to which participants felt their own views reflected valid considerations rather than bias (the unshaded bars). Nor did pronounced disagreement make our participants particularly open to the possibility that they had been less than objective. On the contrary, when the disagreement was especially great, participants not only tended to be especially harsh in their assessment of the other individual's views, they also tended to be especially generous in how they assessed the rationality of their own views. In all, it is hard to imagine more direct support for Benjamin Franklin's observation that "most men… think themselves in possession of all truth, and that wherever others differ from them, it is so far error" (qtd. in Farrand 1937).



The shaded bars represent participants' assessments of how much others' opinions are influenced by valid, rational considerations *minus* how much they're influenced by various sources of bias. The unshaded bars represent assessments of how much their own opinions are influenced by rational considerations versus bias. (From Pronin et al. 2004.)

It's also hard to imagine a stance more at variance with the wisdom of another revered American and a man known for being unusually open-minded: Abraham Lincoln. Talking about a political opponent, Lincoln famously remarked, "I don't like the man, I must get to know him better." ■

References

Balkin, J.M. 2001. Bush v. Gore and the boundary between law and politics. *Yale Law Journal* 110: 1407.

Berlin, I. 2001. Notes on prejudice. The New York Review of Books (October 18). Available online at http://www.nybooks.com/articles/2001/10/18/notes-on-prejudice/.

Ehrlinger, J., T. Gilovich, and Lee Ross. 2005. Peering into the bias blindspot: People's assessments of bias in themselves and others. *Personality and Social Psychology Bulletin* 31: 680–92.

Farrand, M., ed. 1937. *The Records of the Federal Convention of 1787*. Rev. ed. 4 vols. New Haven and London: Yale University Press.

Pronin, E., T. Gilovich, and L. Ross. 2004. Objectivity in the eye of the beholder: Divergent perceptions of bias in self versus others. *Psychological Review* 111: 781–99.

Scalia: Get over it. 2012. *The Daily Beast*. Available online at http://www.thedailybeast.com/cheats/2012/07/18/scalia-get-over-it.html.

Stone, G.R. 2001. From: Equal Protection? The Supreme Court's Decision in Bush v. Gore. Delivered at the Federal Bar Association in Chicago on May 23, 2001. The University of Chicago.

Thomas Gilovich is professor of psychology at Cornell University and co-director of the Cornell Center for Behavioral Economics and Decision Research. He is coauthor of *Social Psychology* and *Why Smart People Make Big Money Mistakes*, and author of *How We Know What Isn't So*. He is a fellow of the Committee for Skeptical Inquiry.

Lee Ross is professor of psychology at Cornell University and cofounder of the Stanford Center on Conflict and Negotiations. He is coauthor of *The Person and the Situation* and *Human Inference*.

This article is based on material presented in the authors' book, *The Wisest One in the Room: How You Can Benefit from Social Psychology's Most Powerful Insights*, published in December 2015 by Simon & Schuster.

A Numerate Life

The man who brought us *Innumeracy* and touted the benefits of mathematical thinking begins his 'anti-memoir' by conveying concerns and questions we should have about biographies . . . or our own lives.

Excerpted by the author from *A Numerate Life: A Mathematician Explores the Vagaries of Life, His Own and Probably Yours*, published in November 2015 by Prometheus Books.

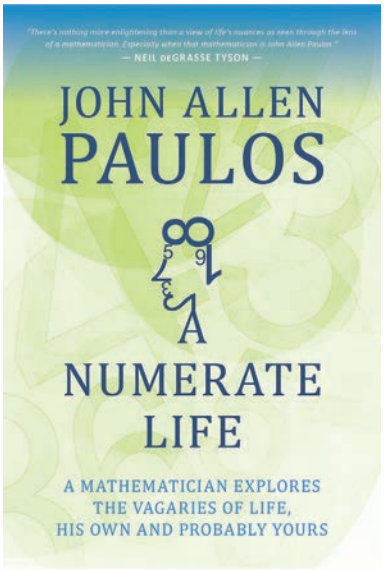
JOHN ALLEN PAULOS

Whether because of my natural temperament, my training as a mathematician, or a late midlife reckoning and reconsideration, I look on the whole biographical endeavor, my own included, as a dubious one. Even George Washington's signature line about cutting down the cherry tree, "I cannot tell a lie," is probably flapdoodle. More likely he said, "No comment" or "I don't recall the incident" or maybe "The tree was rotten anyway." I tend to scoff when reading that a new biography has revealed that the great So-And-So always did X because (s)he secretly believed Y. I'm not particularly ornery, but I often react to such statements about the alleged actions or beliefs of well-known people with a silent *That's B.S.* A more likely reaction if someone makes the claim directly to me is a polite, but pointed "How do you know that?" or even "How could anyone know that?" or, in the case of autobiographies, "How could anyone remember that?"

Memories are often inaccurate or fabricated, perspectives biased, "laws" and assumptions unfounded, contingencies unpredictable; even the very notion of a self is suspect. (But like the nutritionist who secretly enjoys candy and donuts, I've always enjoyed reading [auto]biographies, ranging from James Boswell's *The Life of Samuel Johnson, LL.D.* to Mary Karr's *Liars' Club*.)

Given my skepticism of the biographical enterprise, it might seem I've taken a bold and/or foolhardy step to write a quasi-memoir of my own, but *quasi-* here means "not so much."

True to my doubts, what I've written is a meta-memoir, even an anti-memoir. Employing ideas from mathematics (quite broadly and non-technically construed) as well as analytic philosophy and related realms, but requiring no special background in mathematics, I've tried to convey some of the concerns and questions most of us don't, but arguably should, have when reading biographies and memoirs or even when just thinking about our own lives. The "arguably" is the burden of this book; imparting a certain modicum of mathematical understanding and biographical numeracy is its presumptuous goal.


"There's nothing more enlightening than a view of life's nuances as seen through the lens of a mathematician. Especially when that mathematician is John Allen Paulos."
— NEIL deGRASSE TYSON —
JOHN ALLEN
PAULOS
A
NUMERATE
LIFE
A MATHEMATICIAN EXPLORES
THE VAGARIES OF LIFE,
HIS OWN AND PROBABLY YOURS

One of the first questions that comes to mind when considering a life is an abstract "What is its average length?" or perhaps a more visceral "How long have I got?" Quite relevant is evolutionary biologist Stephen Jay Gould's article "The Median Isn't the Message," in which he describes his cancer diagnosis and the associated median life span of eight months that it allowed. But the median, of course, is not the mean or simple average of patients' life spans; it is the life span shorter than which half the patients survive and longer than

which the other half do. Moreover, the statistical distribution of life spans is right-skewed, meaning many people live considerably longer than the median as did Gould (twenty years). Knowledge of statistics and distributions allayed his anxieties and, more generally, as I'll try to show, mathematical knowledge can shed much-needed light on many other life situations and life stories.

Let me illustrate with a somewhat disguised statistical point. Whatever else a biography may be, it is usually considered to be a story, the story of a person's life. And probably people's most common response to a story is a tendency to suspend disbelief when reading, hearing, or viewing one in order not to spoil its enjoyment. "Let's pretend. It'll be fun." This mindset is quite opposed to that prevailing in mathematics and science where people typically suspend belief in order not to jump to conclusions until they have compelling evidence. "Wait. Why should we believe that?" These two different approaches are not unrelated to different tolerances for false-positive and false-negative conclusions, which I'll elaborate on later. Not surprisingly, perhaps, the latter show-me tentativeness is the approach I will adopt here. It's in line with the bumper sticker that counsels: Don't believe everything you think.

I've always liked the idea of rubbing together incongruous subjects, which seems to me almost a necessary condition for generating creative ideas. At times this habit of rubbing together has earned me a good number of eye rolls, sometimes even a bit of vituperation. People don't always like it when notions or relations they hold dear have reflections in domains such as mathematics that they consider reductive or somehow inappropriate.

That's too bad considering that mathematics is a most productive way of looking at the world. The philosopher Ludwig Wittgenstein once remarked that he looked forward to the day when philosophy disappeared as a subject but all other subjects were approached philosophically. I have a related but weaker wish for mathematics. I certainly don't wish for it to disappear as a subject, but I do wish that it, too, was more widely seen to be an adverb and that its insights and ideas could inform the approach to all other subjects, including biography. With this as a partial motivation, I have over the years written about the connections between mathematics and humor, journalism, the stock market, analytic philosophy, religion, and a number of other topics (but not fish and bicycles). Nonobvious but significant points of correspondence almost always arise if one searches for them.

Here I hope to show that the points of correspondence between mathematics and biography are, despite superficial appearances, quite profound. Carl Sagan, the astronomer, skeptic, and science writer, wrote that we—our DNA, our teeth, our blood—are starstuff, made out of the very same material as the stars. As naturally occurring entities in the universe, we are, in a sense, also "mathstuff"—changing and developing according to mathematically expressible relations, instantiating mathematical notions of all sorts, and illustrating mathematical principles from diverse fields. "Mathstuff," I maintain, is a defensible neologism since patterns are, at least to mathematicians, nonmaterial stuff. It's thus eminently reasonable to try to obtain an understanding of this mathstuff of which, it can be maintained, we and everything else are made. In particular, how do these mathematical patterns express themselves in our life stories?

People don't always like it when notions or relations they hold dear have reflections in domains such as mathematics that they consider reductive or somehow inappropriate.

Bias and Mindsets, Statistics and Biography

I had a number of professors at University of Wisconsin who, I was warned, were horrible; some were said to mumble, others were given to excessive abstraction, a few constantly digressed. Many just lectured. When I enrolled in their courses despite these warnings, I was often surprised. Turns out I usually liked abstract, mumbling digressers. And I much preferred hearing a lecture from someone knowledgeable than listening to fellow students getting together in study groups and giving their usually uninformed perspectives on the topic. Contrariwise, I was often disappointed by those "fun" professors whom most deemed wonderful. The same phenomenon holds for people about whom I've heard only bad (or good) assessments that I find to be baseless after meeting the people in question. I sometimes still get annoyed at my own trustingness.

This, of course, is not a particularly unique realization. Everyone has experienced variants of it. One doesn't have to be too statistically savvy to know that comments and surveys that derive from only a dozen or so people are not very reliable. Neither is it arcane mathematical knowledge that self-selected samples are not very likely to be representative of the population at large.

A small self-selected sample of people responding to a television "poll" about more stringent gun control, for example, may very well arouse a disproportionate number of passionate NRA members and significantly skew the results.

Another example of wayward statistics in academe: Like many universities, mine requires that students take a core survey course in mathematics if they're not going on in the subject. Passing the course requires that a student's grade be at least a C-. Suspecting that the number of C-'s would be much larger than the number of D+'s because of how crucial this small difference is, I decided to examine the number of C-'s and D+'s given in this course over the years for which I could find the records.

Sure enough, I found that approximately eight hundred C-'s and one hundred D+'s were awarded. Someone might point out that the number of D+'s should be lower than the number of C-'s simply as a result of the normal bell-shaped distribution with an average of C or so. This, however, cannot be the explanation, since the drop-off was so precipitous, eight times as many C-'s as D+'s. (The four hundred or so plain D's and roughly seven hundred F's given out during this period indicate that general grade inflation was not the issue.) The reason was probably that, at the crucial cutoff between C- and D+, the faculty were likely to give students a bit of a break. Assigning grades is not a cut-and-dried activity, and many professors seemed to have given students the benefit of a doubt in these close calls rather than being blindly bound to rigid grading that is inevitably somewhat arbitrary.

To vary the examples a bit, consider the museum guard who claimed that a dinosaur on exhibit was 70,000,009 years old. Asked how he knew that, he said that he had been told it was 70,000,000 years old when he'd been hired nine years before. The precision would be laughable, but shouldn't we find it almost as laughable when someone claims to be relating someone else's verbatim (precise) conversations as well as their dates, locations, and contexts?

Why are such elementary understandings and explanations seldom invoked in our reading of personal profiles or full-scale biographies? Biographers (and, of course, autobiographers) select themselves in part because they resonate in one way or another with the subject. They may interview many people about their subject, but even their choice of interviewees is likely to be influenced by their biases. So are the questions they ask, rephrasing them over and over if they don't get the answer they want. Pick almost any potential biographical subject and ask ten people who know him or her what they think of the person, and the responses will certainly be quite varied. Picking only eyewitnesses to events in a subject's life certainly doesn't guarantee truth either. Recall the trial lawyer's quip "The only thing worse than one eyewitness is two eyewitnesses."

Here's a simple thought experiment: consider just yourself as a subject and think of who in your background would write the most scathing biography of you, who would write the most sympathetic account (C- rather than D+ on the scale of a whole life), and who would write the most clueless one. Or, if it doesn't hurt too much, imagine a biography of Stephen Hawking written by Kim Kardashian and one of her written by him. Or come up with your own incongruous pairs of reciprocal biographers. The difficulty of adopting the perspective of a biographical subject's perspective is suggested by the story of two strangers walking on opposite sides of a river. One of them yells across, "How do I get to the other side of the river?" The second one answers, "You are on the other side of the river."

Any story of adultery, to cite one last example, will read quite differently depending on which of four natural biographers write it: the injured spouse, the wandering spouse, the outside lover, or a "neutral" observer. It's interesting to imagine *Madame Bovary* from Charles Bovary's point of view. The fake 2007 newspaper headline in the *Onion*, a satirical magazine, makes the same point: "Majority of Parents Abuse Children, Children Report." Despite these obvious concerns, most people assume biographies or magazine profiles or even informal spoken descriptions of a person are more or less accurate. You might have inferred that this annoys me.

Why are such elementary understandings and explanations seldom invoked in our reading of personal profiles or full-scale biographies?

Phrasing the issue in the jargon of mathematical logic, I note that "is a biography of X" is a so-called unary predicate, and it would be preferable if it were replaced by the binary predicate "is a biography of X written by Y." Perhaps it's even more prudent to consider ternary predicates: "is a biography of X written by Y at time Z." An "autobiography of X," by

contrast, really is a unary predicate unless you happen to be a schizophrenic. Comedian Steven Wright's quip that he was writing an unauthorized autobiography also comes to mind.

Ideally nasty biographies should give a rough measure of the ratio of research undertaken to secrets uncovered. Laudatory ones as well should provide a ratio of the time taken to the positive tidbits found. Autobiographies should be scrutinized for any traces of the Lake Wobegon effect, whereby the author and everyone closely associated with him or her is above average. The problem, of course, is that if one looks hard enough, one will likely find what one is looking for. We're all subject to confirmation bias, the tendency to look largely for confirmation of our hunches and beliefs and rarely for disconfirmation, but perhaps few more so than biographers, who are often either in thrall to their subjects or else detest them.

Whether reading a life story or just listening to a neighbor, we should be aware that very many of our beliefs and attitudes are likely to be a consequence of probabilistic misunderstanding and statistical failings, bad sampling in particular. Most people, for example, become somewhat more reclusive when depressed or otherwise behaving "abnormally," so these behaviors will be under-sampled and thus likely will play a smaller role in their biographies than they do in their lives. Likewise, successful people (as well as their biographers) will tend to see a strong connection between their personal qualities and their success even if they self-effacingly say how lucky they've been; conversely, less successful people will tend to see a weak connection. Neither viewpoint is statistically robust.

One other quite significant, albeit underappreciated, point about statistics in the presentation of biographies bears repeating. As I mentioned earlier, an important aspect of a story is that there is a tendency to suspend disbelief while seeing, reading, or hearing it so as to not spoil its enjoyment. "Let's pretend there really is a monster like this." Loosely paraphrased in statistical parlance, this means that one risks a so-called Type I error (a false-positive); that is, saying an important incident or phenomenon occurred that really did not. This is not the situation in statistical or scientific contexts where one typically suspends belief so as to not be fooled. "How do we know that?" In statistical parlance, one risks making a so-called Type II error (a false-negative); that is, saying that an important incident or phenomenon that really did occur did not.

Both biographers (storytellers generally) and statisticians (scientists generally) wish to avoid both sorts of errors, but biographers are a bit more careful about not ruling things out, scientists a bit more careful before admitting them. What exists for the two sorts, their ontology, is different; for storytellers it's generally more baroque, for scientists more bare-bones. To parody this difference in mindset, we might say that out of five crises, storytellers predict seven of them, and scientists predict three of them—hyperbolic versus hypobolic, which should be a word.

Type I and Type II errors are part of a complex of notions surrounding Bayes's theorem, an extremely seminal result in probability theory that tells us how to update our probabilities in the light of new evidence. For example, if a fair coin (heads-tails, H-T) and a two-headed coin (H-H) are on a table and we choose one of them, the probability we choose the fair coin is 1/2. But if after we've chosen a coin, we flip it three times and obtain three consecutive heads, Bayes's theorem tells us the probability that we chose the fair coin shrinks to 1/9.

This is, of course, much harder to do with more nebulous stories and biographies, but do biographers make much of an attempt to indicate how they come to their initial evaluations of a subject or how they've changed their minds about him or her in the light of new documentary evidence? I doubt it. Certainly excusable, but why make so little use of possibly relevant mathematical and scientific tools?

One proto-Bayesian, the empiricist Scottish philosopher David Hume, underlined the importance of considering the probability of supporting evidence when he questioned the authority of religious hearsay: one shouldn't trust the supposed evidence for a miracle, he argued, unless it would be even more miraculous if the report were untrue. In ancient times, biographies of saints and kings were replete with miracles. Contemporary biographies are devoid of miracles but still contain too many exploits and adventures that seem considerably less likely than their nonoccurrence. It's the same impulse, but attenuated. ■

Contemporary biographies are devoid of miracles but still contain too many exploits and adventures that seem considerably less likely than their nonoccurrence.

John Allen Paulos is a professor of mathematics at Temple University and the author of eight previous books, including the bestselling *Innumeracy* and *A Mathematician Reads the Newspaper*. He is a fellow of the Committee for Skeptical Inquiry. This article is excerpted from the introduction and chapter 2 of his new book *A Numerate Life: A Mathematician Explores the Vagaries of Life, His Own and Probably Yours* (Prometheus Books, November 2015). For further information, visit johnallenpaulos.com.

Does the Scientific Method Have Biblical Origins?

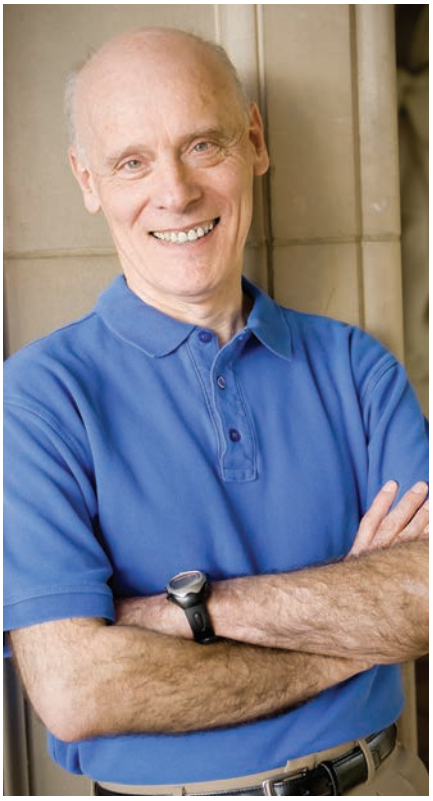
Two astounding claims of a Christian ministry are evaluated: that the scientific method originated in the Bible and old-Earth creationism is vastly superior to naturalistic evolution in predicting scientific discoveries.

BRIAN BOLTON

Hugh Ross is the founder and charismatic leader of a Christian ministry named Reasons to Believe (RTB) that promotes old-Earth creationism. Although RTB has been active for twenty-five years, it holds the least popular creationist viewpoint among Christian fundamentalists and the least known among Christians of all persuasions. This is most likely because RTB accommodates three major conclusions from mainstream science.

Specifically, RTB creationism stands apart from its creationist competitors (Answers in Genesis, Discovery Institute, and Institute for Creation Research) in adopting the 13.5-billion-year-old universe and the 4.5-billion-year-old Earth and rejecting the biblical worldwide flood. Reasons to Believe maintains that the Noachian Deluge was a regional flood that drowned all humans (except eight), since they all lived in a small area of the planet. Also, while endorsing the Adam and Eve narrative, Reasons to Believe dates the event to about 50,000 years ago. These RTB postulates are anathema to the dominant young-Earth proponents, because they contradict the literal truth of the Bible. Consequently, the other creationist groups consider RTB creationism to be unbiblical.

What is overlooked by the critics of RTB's old-Earth viewpoint is that Reasons to Believe unabashedly accepts almost all other standard inerrantist biblical beliefs. Examples are the reality of a supernatural realm and interventionist miracles, the existence of angels including Lucifer, the historic personage of Adam and Eve who lived in a God-designed Middle Eastern garden and are the ancestors of all people, the dominionist distinction between "soulish" animals and spiritual humans, eternal life for believers in a "new creation" with God and Jesus, and the doctrine that those who reject Jesus will be "removed from his presence."

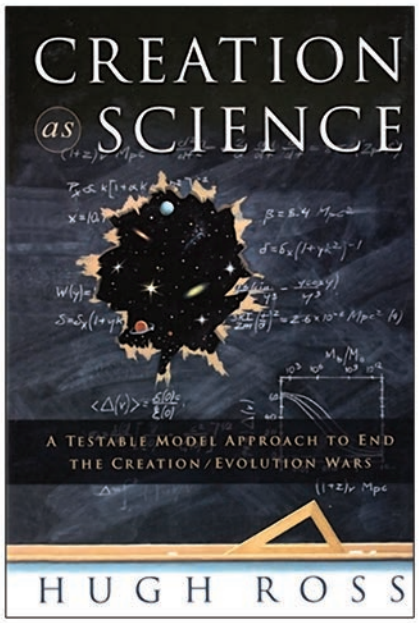


Hugh Ross, founder of Reasons to Believe.

The predominant themes in Ross's presentation of RTB's old-Earth creationist conception are that it is derived from the Bible, it is scientifically testable, and it is validated by virtually all scientific knowledge. He also claims that the Bible contains exclusive truth and predicts scientific discoveries thousands of years ahead of time. Unless otherwise indicated, all statements are from Ross's 2009 book, *More Than a Theory: Revealing a Testable Model for Creation*.

RTB's Biblical Foundation

According to Ross, RTB creationism is based on a theistic hypothesis that is detailed in the Bible. Specifically, the Bible's explanation of the origin and history of the universe and life on Earth are "predominantly literal" and



"reliably factual." However, scripture must be interpreted both literally and consistently, he says.

Ross states explicitly that he is building RTB's case for the God of the Bible as the designer and creator of all nature—a supernatural, caring, intelligent designer—the one who embodies truth. Yet he continually invokes the terms *scientific integrity*, *scientific credibility*, *scientific merit*, *scientific value*, and *scientifically testable evidence* when favorably characterizing RTB creationism and castigating his creationist adversaries who make exactly the same theological assumptions he does. He even compares them to flat-Earth and geocentrism believers.

After severely criticizing the other biblical creationists for their lack of scientific credibility, Ross then contradicts himself by rejecting the widely accepted paleontological and molecular-genetic evidence documenting the evolution of humans from earlier primates, preferring instead the Adam and Eve story.

Ross's admiration for the Bible includes the denigration of all other sacred books; he claims, for example, that the Bible contains more scientific information than any other religious text; the Bible uniquely predicts scientific discoveries; only the Bible gives an abundance of specific, testable detail about cosmic events; the Bible alone exhorts readers to objectively test before they believe; and therefore the Bible is the best choice to build a scientifically testable theistic model.

Did Ross review all two dozen of the world's sacred religious texts? Or more appropriately, did he ask religious scholars from the other faith traditions to provide their independent opinions about his assertions of biblical superiority?

Table 1: Six Bible Verses that Supposedly Established the Scientific Method

Acts 17:11–12.	The Berean Jews received the message with great eagerness and examined the Scriptures every day to see if what Paul said was true. As a result, many of them believed.
Romans 12:2.	Offer your bodies as a living sacrifice … do not conform to the pattern of this world, but be transformed by the renewing of your mind. Then you will be able to test and approve what God's will is.
1 Thessalonians 5:21.	Do not quench the Spirit. Do not treat prophecies with contempt but test them all; hold on to what is good, reject every kind of evil.
1 John 4:1–2.	Do not believe every spirit, but test the spirits to see whether they are from God, because many false prophets have gone out into the world. This is how you can recognize the spirit of God: Every spirit that acknowledges that Jesus Christ has come in the flesh is from God.
Revelation 2:2–3.	I know that you cannot tolerate wicked people, that you have tested those who claim to be apostles but are not, and have found them false. You have persevered and have endured hardships.
Job 34:4.	Let us discern for ourselves what is right; let us learn together what is good.

All verses are from the New International Version (NIV), which is Ross's preferred translation.

Scientific or Biblical Method?

Ross asserts that the scientific method could more accurately be called the "biblical method." He repeats this claim in a dozen statements, including five listed here:

- Scripture is the source of the scientific method.
- The scientific method originated in Scripture and in the development of Reformation theology.
- The benefits of the scientific age come from applying the testing process as set forth in Scripture.
- The Genesis creation account reflects the classic scientific method.
- Historically, Christianity gave birth to both the scientific method and the scientific revolution.

Although these statements are clearly grandiose and some introduce extraneous issues, Ross's unequivocal claim is that the scientific method has its roots in the Bible. What direct evidence does Ross provide to support his claim? Quite appropriately, he cites six verses from scripture that he believes document his case. These are given in Table 1.

The scientific method relies on observation, investigation, experimentation, and quantification to address questions about the natural world. Ross's six selected Bible verses are concerned with false prophets, false apostles, Paul's truthfulness, and God's will. Four verses include the words *test* or *tested* but actually refer to the examination of prophecies, spirit messages, and teachings by applying some form of Christian litmus test. They do not constitute anything like a scientific investigation involving objective tests of observable phenomena in the natural world. Ross simply equates the words *test* and *tested* with scientific methodology.

The verse from Job is puzzling. God did collaborate with Satan in testing Job's faith in a gruesome story that illustrates wanton cruelty. However, Job 23:10, "When he has tested me, I will come forth as gold," would be more consistent with Ross's other choices. Also, Ross failed to cite another verse that addresses testing: "Do not put the Lord your God to the test," which is found in both the Pentateuch (Deuteronomy 6:16) and the Gospel (Luke 4:12). Does this verse rule out all scientific investigation of theological questions?

Contradicting Ross's assertion about the "biblical method" is the consensus opinion of historians of science who locate the origins of modern science in the Greek Golden Age starting in 600 BCE and continuing for six centuries. Scientific inquiry was initiated in Ionian Greece, soon spreading to Athens and then to Alexandria. But the early precursors are found in Babylonia, Egypt, and Phoenicia several millennia before the advent of Greek science.

Prominent Greeks advanced knowledge about the natural world using the secular strategy of inquiry known as the scientific method. They made landmark discoveries leading to development of the modern disciplines of acoustics, anatomy, astronomy, botany, cartography, engineering, geometry, hydraulics, mathematics, mechanics, medicine, optics, pharmacology, physics, and zoology. Because the New Testament verses in Table 1 were written sometime after 50 CE, they could not have influenced the genesis of the scientific method.

Ross also declared that Christian scholars throughout church history have asserted that the biblical narratives parallel the scientific method. However, he does not provide a single illustration. Ross makes other similarly remarkable claims, such as, "Every major Christian doctrine is either founded upon or linked to thousands of wide-ranging scientific details."

What should be recognized with respect to Ross's claim about the biblical origins of the scientific method is that the ancient Greeks were pagan polytheists who in succession worshiped a pantheon of Olympic gods, became attracted to the mystery (salvation) religions, and later embraced Epicurian and Stoic philosophies. However, the popular religions continued to be favored by Greeks. There is no indication that the Bible influenced in any way early Greek scientists.

It should be mentioned that Ross cites three other items to buttress his claim: Galileo's alleged rebuke of Catholic theologians, an exposition about biblical faith, and reference to the writings of a Scottish theologian. Without any direct support from the Bible or history, these ancillary points are not helpful to Ross's case.

The only reasonable conclusion to be reached is that this is an example of imaginative Christian revisionism associated with the fabrication of the pseudo-discipline called "theistic science."

Predicting Scientific Discoveries

Ross asserts that good science involves using models that make predictions that can be tested for validity. He states correctly that tests of predictive success are valued by the scientific community. However, Ross is referring to his own test of how well four creation and evolution viewpoints predict future scientific discoveries. He selected four competing models for his prediction test: RTB old-Earth creationism, young-Earth creationism, theistic evolution, and naturalistic evolution. To accomplish the objective of a comparative evaluation of predictability, the critical activity was clearly the formulation of the predictions. Ross's project consisted of three steps.

There is no indication that the Bible influenced in any way early Greek scientists.

First, Ross identified eighty-nine issues in three categories (simple sciences, complex sciences, social sciences) for which predictions would be developed. Examples of these issues are fine-tuning of physical laws, humanity's arrival in cosmic history, habitable zones for intelligent life, source of prebiotic molecules, diversity of early life, mass speciation events, human descent, occurrence of natural disasters, biblical inerrancy, creation of Adam and Eve, and the existence of the god of the Bible.

Second, Ross formulated specific predictions about what scientists should discover in future research for each of the creation and evolution viewpoints for the eighty-nine issues. In what most people would regard as a wholly unscientific approach, Ross developed all predictions himself "while attempting to remain as neutral and objective as possible." His predictions are summarized in his 2006 book, *Creation As Science: A Testable Model Approach to End the Creation/Evolution Wars* (pp. 227–52).

Table 2: Ross's Predictive Rates for Four Creation and Evolution Viewpoints

Judged Success	RTB	YEC	TE	NE
Fulfilled (or partly)	78%	25%	15%	2%
Falsified (or partly)	0%	51%	42%	75%

The labels are: RTB (old-Earth creationism), YEC (young-Earth creationism), TE (theistic evolution), and NE (naturalistic evolution).

The predictive rates were calculated from Ross (2009, p. 244).

The columns do not add to 100 percent because the undetermined category (not yet fulfilled) was omitted.

Third, Ross evaluated the degree of success of his predictions for the four viewpoints on eighty-nine issues using a five-point scale: fulfilled, partly fulfilled, not yet fulfilled, partly falsified, and falsified. There was apparently no input from representatives of any other viewpoints. The results of Ross's one-man evaluation of the four viewpoints are shown in Table 2.

The outcome of this elaborate exercise should not be surprising to anyone, especially the monumental difference between Ross's RTB old-Earth creationism and godless, naturalistic evolution. With a fulfillment rate of 78 percent versus 2 percent and a falsification rate of 0 percent versus 75 percent, some would construe these results as convincing evidence of RTB creationism's superiority over materialistic, ungodly evolution. Of course, this evaluation is not a legitimate demonstration of the relative merits of RTB creationism and naturalistic evolution; it is instead just a contrived and meaningless expression of Ross's highly favorable opinion of his own biblically derived viewpoint and the corresponding abysmal failure of all others.

Ross summarized by declaring that RTB creationism excels on predictive success as well as explanatory power and performs well on five additional "tests" he devised: censorship, stultification, integration, research passion, and destiny implications. He concluded that RTB creationism has the power to change lives for the better because "the spiritual heart can rejoice with what the mind knows to be true."

Finally, Ross accuses evolutionists (and young-Earth creationists) of engaging in "ongoing purposeful attempts to ignore or shut out RTB's claims." Considering how extreme Reasons to Believe's claims really are, it is understandable that the National Academy of Sciences, the Vatican Science Pontificate, and other scientific organizations would disregard RTB creationism. ■

There's much more available on our website!

Skeptical Inquirer

Here's just a sample of what you'll find:

Grief Vampires Don't Come Out Only at Night

Susan Gerbic casts a skeptical eye on "grief vampires" such as self-proclaimed psychic Tyler Henry: "These people come and go fame-wise. His flame might be bright for the moment, but it could quickly fade into obscurity, or it could ignite a fire that will burn the memories and interrupt and corrupt the grieving process for parents who go to him in desperation and loss

Trump-Rage: How Political Anger Clouds Our Thinking

Tamar Wilner examines how anger in the political realm can cloud critical thinking: "Anger, managed correctly, can drive ethical action. The key is to focus on the informational content of those anger states and find the most effective ways to fashion and spread correctives.

For more online columns, features, and special content, visit **www.csicop.org.**

References

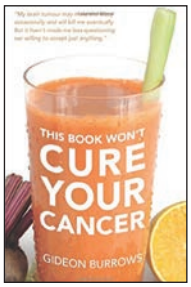
Ross, H. 2006. *Creation As Science: A Testable Model Approach to End the Creation/Evolution Wars.* Colorado Springs, CO: NavPress.

———. 2009. *More Than a Theory: Revealing a Testable Model for Creation.* Grand Rapids, MI: Baker.

Brian Bolton is a retired research psychologist with a background in mathematics, statistics, and psychometrics. His contributions in psychological measurement, personality assessment, and the psychology of disability have been recognized by universities and psychological societies. He lives in Georgetown, Texas.

Clear Thinking About Cancer

HARRIET HALL



This Book Won't Cure Your Cancer. By Gideon Burrows. NGO media, 2015. ISBN 978-0955369599. 212 pp. Paperback. $15.79.

Gideon Burrows has inoperable brain cancer that is slow growing but is inevitably going to kill him. He has written a remarkable book about his experience, *This Book Won't Cure Your Cancer*. He is a professional wordsmith, and he describes his experience of illness so vividly that the reader enters into his life, feels what he feels, and shares his suspense about what the next scan or doctor visit will reveal.

Along with him we suffer through the panic and fear, the chaos, the agonies of delays and uncertainty, the unpleasant hospital environment, and specialists with poor bedside manners. We follow him through difficult decisions about how to share the bad news with friends, relatives, and his young children; we understand why this engenders guilty feelings. The story is as engaging as a detective story; we can hardly wait to see what the next scan will show and how the story of his illness will play out. It puts a human face on the cancer experience, which would make the book valuable for that alone, but it is much more. The gradually unfolding episodes of his personal story are interwoven with what amounts to a primer on how to think critically about science-based medicine vs. alternative treatments. I can't recommend this book highly enough.

Untrustworthy Information

When people are diagnosed with cancer, they are vulnerable and desperate. They look for information and are likely to find cookbooks, miracle stories, alternative medicine, and "forbidden cancer cures." Their friends bombard them with advice. Most of those sources "offer hope to people when they need it most, but have earned no right to do so."

Burrows read "the biggest cancer book of all time," *Anticancer: A New Way of Life*, by Servan-Schreiber, and was bitterly disappointed. It offers a plan to keep cancer at bay through mental balance and diet, but he realized that Servan-Schreiber makes unwarranted extrapolations from single scientific studies and anecdotes, and he blames the victim by trying to establish a lifestyle cause for a kind of tumor for which science has found no cause and which is likely due only to bad luck. Servan-Schreiber thought he had beat cancer, but it returned with a vengeance. Then he wrote a second book. Instead of acknowledging that his methods hadn't worked, he rationalized that he hadn't followed his own advice carefully enough: He hadn't done enough to control stress or maybe he hadn't eaten properly. He died shortly after the second book was published. People are still reading his books and following his advice; many of them don't realize he is dead.

The Cancer Culture

Burrows describes the prevailing cancer culture that depicts it as a battle, calls patients brave warriors, and celebrates the victorious survivors. He says,

> Cancer is not a brave battle to fight, it is a terrible disease to run away from. It is a puzzle to try to solve, something to try to keep at bay using the very best tools we have. . . . I'm not brave. I'm just getting on. Making the most of what I've got. Crying, and laughing, and forgetting, and remembering, and plodding and pedaling on. Like we all do, cancer or not.

Three different specialists gave him the same prognosis. His cancer is inoperable. It will inevitably progress and need treatment, but for now all that is needed is to monitor it with scans and to control his seizures with medication. Friends suggested he keep looking for a surgeon who would be willing to oper-

ate. What if he searched the world and found five doctors who wouldn't operate and a sixth who would? Would it be rational to trust the sixth doctor's opinion more than that of the other five? Of course not. He should trust him *less*. Unfortunately, many patients play this game, spend enormous amounts of money, and end up worse or no better than they would have been.

What if he proposed that blowing up 100 red balloons would cure cancer? Is that really any more ridiculous than coffee enemas?

He talks about the false promises of unconventional cancer doctors such as Burzynski (see David Gorski's article "Stanislaw Burzynski: Four Decades of an Unproven Cancer Cure" in the March/April 2014 SI) and the impetus to "try anything." He said it is not reasonable to "try anything" if there is no evidence that "anything" works. People say it's worth trying because there is no evidence that it *doesn't* work. He spotted the fallacy in that reasoning: "There are many millions of things that have not been proven to *not* cure cancer, but mostly because many millions of things have never been tried. That does not mean they are a potential cure, nor that they are sensible to pursue."

What if he proposed that blowing up 100 red balloons would cure cancer? Is that really any more ridiculous than coffee enemas? When does one *anything* become something we should try, and who gets to decide what is too ridiculous to try? Even alternative practitioners disagree with each other. Where do you draw the line? If a treatment has not been proven to work, is not biologically plausible, has not been tested in animals, and is not backed by the majority of scientific experts, shouldn't it fall on the same side of the line as the red balloons?

He doesn't blame people who go off in pursuit of a promised miracle cure. He understands their desperation and the comfort of having a hope to cling to. Rather, he blames those who offer that *anything* without a fair, accurate, and accountable foundation. The power and responsibility to advise about cancer treatment "should only be earned by results, proof, and accountability."

What Constitutes Proof?

Burrows describes how people ignore reality to cling to their beliefs. When alternative medicine proponent Chris Woollams's daughter survived for longer than average, he credited her alternative treatments; when her tumor recurred and killed her, he blamed her for not following his regime properly. When "Wellness Warrior" Jessica Ainscough died, her followers claimed it was because she didn't do Gerson therapy correctly. Those who get both conventional and alternative treatment and survive often refuse to give credit to the conventional treatment: ". . . it doesn't matter what *you think* cured you or made you feel better. Opinion doesn't come into it, only the biology and science."

Testimonials abound. "It worked for me" is a kind of "social proof" but in reality is no evidence at all. In fact, personal testimonies are the enemy of proof. We hear about successes, but we don't hear about the failures because no records are kept. To be taken seriously, a theory has to be falsifiable. Excusing failures by saying the treatment wasn't properly followed leaves no way to determine whether it *actually* works. Controlled scientific studies can test whether it works; they are based on falsifiability. Proponents of alternative medicine often reject the scientific approach; they argue that their treatments are not amenable to randomized controlled trials, and that they might still work for an individual even when studies show they didn't work for the people in the studies.

He faults alternative providers for not carrying out even the most basic scientific controls. If they have a treatment that works, they should want to inform the world. It would be simple to publish honest, even independently audited lists of all treated patients with data on *all* the successes and failures. The argument that there isn't money to test alternative medicine is a red herring; even small businesses monitor their performance indicators. Diet advice and cancer cookbooks abound, but, he notes, "The most science has shown is that having a generally healthy diet and exercising regularly lowers our risk of getting cancer. It does not *prevent* cancer. It does not *cure* it."

Other bits of wisdom he imparts include:

The News Media

The news media report real new developments in scientific cancer treatment right along with sensationalist stories about unreliable pseudoscientific claims. They strive for "balance" and give alternative treatments more credit than they deserve. This is wrong-headed; it's not a matter of two politicians presenting opposing views; it's a matter of scientific fact and expert opinion versus speculation and uninformed opinions of non-experts (and sometimes even of charlatans). The news serves to confuse rather than to inform.

Confronting Rubbish

Is it rude or cruel to confront people who talk rubbish about cancer? If we don't, are we allowing potentially more damage to be done just to avoid a personal feeling of discomfort? "How far does our reluctance to criticize mean that energy, passion, and grief is channeled away from cancer cure research, not towards it?"

Ancient Wisdom

"Ancient practice is not always ancient

wisdom. . . . That something was being done in the earliest days of civilization to cure illnesses should make us more wary of those treatments, not keener to try them for ourselves… progress means replacement of the old and ineffective, the unproven and dangerous, by the new and better, the proven and safer."

Religion

People ask, "What about God?" As an atheist, the question never arose for Burrows, even though he holds a degree in theology. He explains why prayer is only likely to make those who pray feel like they are acting virtuously, and why it is logically indefensible as an attempt to improve health outcomes.

Cancer is Natural

"Cancer doesn't care about you." It isn't something gone wrong; it's DNA doing what DNA is supposed to do. Without DNA mutation, there would be no evolution, no us. Cancer is a natural consequence of the same mechanisms that make our hair grow and our wounds heal. There are many cancers, and half of us will get one eventually. Cancers are not always a death sentence. We can cure some of them and live with others.

Doctor-Bashing

Proponents of alternative medicine love to criticize doctors. It's undeniable that there is a lot wrong with conventional medicine. The system is flawed. Individual doctors are not perfect; they miss diagnoses and make mistakes. "But if we exercise skepticism and doubt about medically trained doctors, oncology and conventional medicine, then we should subject alternative medicine to at least the same level of doubt and scrutiny. In fact, I would argue alternative medicine deserves far more doubt because it self-consciously puts itself outside conventional medicine that has been proven by time and experience to, mostly but not always, get it right."

Big Pharma and Conspiracies

Big Pharma deserves blame for many sins, but it is ridiculous to say it doesn't want to find a cure for cancer or already has a cure and is keeping it secret. He explains why those conspiracy theories are completely wrong-headed. The idea that there's no money in natural products is easily refuted by the success of bottled water and natural health food stores.

Who Are the Experts?

Self-declared "experts" write books. But it takes only two minutes on the Internet to demonstrate that there are experts in that field who question or disagree with them. Failure to reveal the controversy should make readers question whether anything else in the book is true. Burrows put his life in the hands of real experts who know far more about his tumor than any patient or self-proclaimed cancer guru. He can make choices about his care, but "they set the boundaries between which I can make decisions. That's the rational way to behave, and I understand that they know best."

Major Issues for Society

Conventional medicine and alternative medicine operate in two separate universes that don't communicate with each other. Alternative providers fail to understand the scientific realities of modern cancer treatment. Conventional providers often fail to appreciate their patients' fears and misunderstandings. Patients are left in limbo. As a society, we need to have a sensible conversation about dying and not just keep patients with cancer alive longer at all costs. We should learn when to let go. A recent study found that hospice patients with an end-of-life plan not only have a better quality of life than those who insist on every possible intervention, but they actually live longer.

Hope

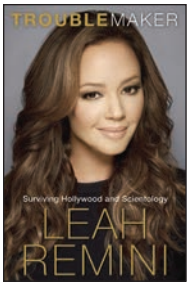
At the end of the book, Burrows's condition is stable and he is far from devoid of hope; but his hope is centered in realism and rationalism. He hopes for the possible, not for the impossible. Perhaps a change in medication will better control his seizures; perhaps he will survive long enough for science to find an effective cure for his cancer. He believes that reality and science are always better than lies and belief in magic. He thinks it is a shame that patients turn to alternative medicine and make themselves ineligible for clinical trials that offer real hope for contributing to the greater good.

Burrows predicts that believers in alternative medicine will demonize him for writing this book, but he makes them this promise: "If you can show me firm, peer-reviewed scientific evidence that your cancer prevention therapy or cure works, I will no longer call it alternative medicine. I'll call it medicine. And if proven to work for my particular brain tumor, I'll be first in line for a dose." Burrows's message is that we often act irrationally around cancer. He wrote his book not to advise patients about cancer treatment but to encourage people to look at the information they are given (from both conventional and unconventional sources) with a sharper critical eye. This book beautifully complements Siddhartha Mukherjee's Pulitzer Prize–winning *The Emperor of All Maladies: A Biography of Cancer*. Reading both of them will help you understand pretty much everything worth knowing about cancer and the people who suffer from it. ■

Harriet Hall, MD, is a retired family physician who writes about pseudoscience and questionable medical practices. She is a fellow and member of the Executive Council of the Committee for Skeptical Inquiry and a frequent contributor to Skeptical Inquirer. A slightly longer version of this review appears on the website sciencebasedmedicine.org.

A Celebrity's Experience in Scientology

WENDY M. GROSSMAN



Troublemaker: Surviving Hollywood and Scientology. By Leah Remini. Ballantine Books, New York, 2015. ISBN 978-1-101-88696-0. 234 pp. Hardcover, $27.

The actress Leah Remini, known for playing outspoken, ballsy characters—most famously in the long-running sitcom *The King of Queens*—always seemed miscast as a Scientologist. Not that actors have to be like the characters they play, but it seemed a pity.

As it turns out, like many other Scientologists her age, Remini was brought into the Church by a parent, in her case at seven when her divorced mother's new boyfriend was a member. The boyfriend didn't last, but Remini liked that he listened seriously to her and her sister. When they began taking introductory courses and doing drills, she found this approach permeated the Church. She liked feeling equal to grown-ups, and she believed that Scientology was a way of helping people and doing good for the world, which Remini says is common to many members. When her mother proposed moving to Florida to become part of the Church full time, Remini and her sister went willingly.

In her new book, *Troublemaker*, written with Rebecca Paley, Remini interweaves stories of her personal and professional life with her history in and growing doubts about Scientology. Paley deserves a lot of credit for helping keep Remini's voice. Remini also seems content to discuss her own flaws and mistakes.

The tranche of books about Scientology that began in 2011 with Janet Reitman's *Inside Scientology* (reviewed in SI, January/February 2012) and continued in 2013 with Lawrence Wright's *Going Clear* (now a movie), Jenna Miscavige-Hill's *Beyond Belief*, and John Sweeney's *The Church of Fear* (see my review of all three in the May/June 2013 Skeptical Inquirer, online at http://www.csicop.org/si/show/clear_and_fear_scientology_under_review) all had new revelations to make about the worst abuses the Church of Scientology has heaped on its most devoted members. These books revealed the existence of the Rehabilitation Project Force (RPF), Scientology's equivalent to prison, the autocratic behavior of Church leader David Miscavige, and the lengths to which the Church will go to keep its best-known adherent, Tom Cruise, happy. Remini's book does not contain new information on this level. Instead, it paints an intimate picture of the lives of dedicated Scientologists, those who are close adherents but not deep insiders. Remini was not, after all, a celebrity for half her time in Scientology.

As a result, many practices are outlined in a new kind of detail. L. Ron Hubbard's "tone scale" has been described from Hubbard's writing by, for example, Reitman and Wright. Remini talks about what it was like learning to use it by being required to stop complete strangers on Hollywood Boulevard, ask them questions, and assess the tone of their answers. She similarly discusses what it feels like to go through auditing and security-checking, and how the Church's manipulation works when you're the person on the receiving end. You are, she writes, encouraged to report the misdeeds of others—but doing so is likely to open you to extra auditing as well. She also writes about the extensive financial burden Scientology places on ordinary families, "helping" them raise their credit limits to donate the maximum to the Church.

In one section, Remini recalls her interview with John Sweeney for his 2007 BBC documentary, *Scientology and Me*. "The guy is crazy," Church spokesman Tommy Davis warned her. Sweeney then startled her by asking, "Does David Miscavige hit people?" As she tells it now, she was deeply upset by the way Davis and his fellow Church PR person, Mike Rinder, treated Sweeney, pushing him to the limit until he exploded (an incident the Church recorded and placed on YouTube). She regretted that he apologized for that explosion. "The BBC," she writes, "had no idea of what this man had to endure." By 2010, Rinder had left the Church and was telling Sweeney the truth on his follow-up documentary,

The Secrets of Scientology.

"I don't go on the Internet," she told Sweeney in 2007 in an interview that didn't air (but that both recount in their books). In late 2012, inspired by an email sent by former Scientology member Debbie Cook outlining the abuse that actually happened within the Church, she finally did.

Remini left in 2013. In contemporaneous interviews, the reason seemed to boil down to her years-long inability to get an answer to a single question: What had happened to Church leader David Miscavige's wife, Shelly, who had vanished from public view? *Troublemaker* makes it plain that this particular question was one Remini kept picking at. But she had other doubts, raised by what she saw of Cruise's behavior and the Church's slavish efforts to keep him happy (which included forcing Remini to write myriad reports and apologies for tiny infractions at his wedding).

As far as Remini could see, the latter violated L. Ron Hubbard's own policies, and besides, what kind of role model Scientologist was a three-time divorcee? Meanwhile, her mother had reached the high-level status of OT VIII and class VI auditor and found "she couldn't move objects with her mind or cure cancer by the force of her will. She was still just herself." In a situation where many families choose to stay with Scientology when one member leaves, Remini was lucky: most of her family left with her, as you can see in her reality series, *It's All Relative*.

Now, two years later, Remini sums it up: "Despite its claims to the contrary, the practice doesn't help you better the world or even yourself; it only helps you be a better Scientologist." ■

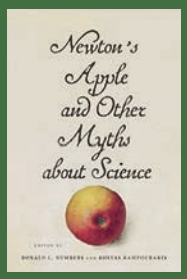
Wendy M. Grossman is the founder and former editor (twice) of *The Skeptic* (U.K.) and a Committee for Skeptical Inquiry fellow. In her 1995 article in *Wired*, "alt.scientology.war," a former Scientology PR man, Vaughn Young, predicted that the Internet would be Scientology's Vietnam. She now says he seems to have been absolutely correct.

NEW AND NOTABLE]

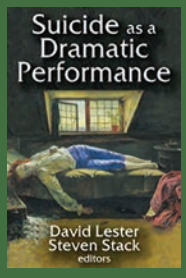
Listing does not preclude future review.

CLIMATE CHANGE: What Everyone Needs to Know. Joseph Romm. One of the United Kingdom's most influential communicators on climate science and solutions provides a compact primer on what everyone should know. He starts with a chapter on climate science basics, then describes the causal links to more extreme weather, explores the projected impacts of climate change and how to avoid the worst impacts, explores climate politics and policies, and examines the role of clean energy. A final chapter, "Climate Change and You," explores some of the more personal questions that climate change raises for individuals and families. Oxford University Press, 2016, 302 pp., $16.95.

MEMORY AND MOVIES: What Films Can Teach Us about Memory. John Seamon. Memory is of course key to many experiences examined within the realm of skepticism, from false memories of sexual abuse and alien abduction to mistaken recollections of paranormal experiences. Films tell stories about the human condition, and psychology professor John Seamon shows how memory as depicted in popular movies can shed light on how human memory works. Seamon uses examples from movies to offer an accessible description of what science knows about memory function and dysfunction, including describing the process of long-term memory with examples from such films as *Castaway* and *Groundhog Day*; the effect of emotion on autobiographical memory in *The Kite Runner*, *Titanic*, and so on. The MIT Press, 2015, 272 pp., $29.95.



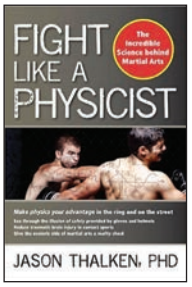
NEWTON'S APPLE AND OTHER MYTHS about SCIENCE. Ronald L. Numbers and Kostas Kampourakis, editors. Twenty-eight scholars, many of them historians or philosophers of science, examine and refute a number of popular myths about science, brushing way misconceptions to allow a clearer picture of great scientific breakthroughs from ancient times to the present. Among the myths refuted is that no science was done in the Dark Ages, that fear of public reactions alone led Darwin to delay publishing his theory of evolution, that Gregor Mendel was far ahead of his time as a pioneer of genetics, and that a clear line separates science and pseudoscience. Myths about particle physics and Einstein's relativity are also exposed. A unifying theme is that rather than deriving from lonely acts of genius, science is a cooperative activity of dedicated, fallible human beings. Harvard University Press, 2015, 287 pp., $27.95.



SUICIDE AS A DRAMATIC PERFORMANCE. David Lester and Steven Stack, editors. Each suicide is as unique as the individuals involved, but dramatic aspects of the death often provide important clues for understanding the mental state of suicidal individuals. This book provides insight into the psychological, social, and cultural aspects of suicide as dramatic performance. Some people kill themselves in hopes of spurring social change, leaving manifestos; others do it to air personal grievances, and so on. Some choose to perform their act live on television or post it on social media, knowing that the story—and thus potentially their message—will be seen by millions. David Lester and Steven Stack investigate what happens before a suicide when the suicidal individual must make decisions and formulate the script for his or her suicidal act. The book offers insights into suicide as staged drama, including chapters on the intended audience, the suicide note, the location and method chosen, and cultural scripts including suicide-by-cop, and duels. Transaction Publishers, 2015, 354 pp., $59.95.

The Physics of Martial Arts

PETER HUSTON



***Fight Like a Physicist: Make Physics Your Advantage in the Ring and on the Street*. By Jason Thalken.** YMAA Publication Center, Wolfeboro, New Hampshire, 2015. ISBN: 1-59439-338-9. 161 pp. Paperback, $16.95.

The martial arts field is many things to many people, and it often confuses not just the general public but also skeptics. What's an outsider to make of a wide-reaching milieu that includes contact sports, historical reenactment, self-defense training, and New Age pseudohistorical mystical gobbledygook when all are labeled "martial arts"? This question brings us to a new book called *Fight Like A Physicist: Make Physics Your Advantage in the Ring and on the Street*, written by a PhD physicist. Although Jason Thalken writes well, footnotes carefully, and uses interesting analogies to explain concepts well, one has to ask what, if anything, does this book include that would be of interest to skeptics?

Although most of the 161-page book focuses on subjects such as the best designs and advantages of using helmets and boxing gloves in contact sports as well as the basic physics of strikes of different kinds (and therefore is of limited interest to most skeptics), chapter 9, "Qi and Pseudoscience in the Martial Arts," is an eighteen-page gem that skeptics should be aware of. It is that brief chapter that this review will focus on. Although chapter 8, "Guns, Knives, and the Hollywood Death Sentence," discusses the effects of weapons and combat in reality versus the movies for fourteen pages and also contains information of interest to the general skeptic, chapter 9 is of the most interest to most readers of the Skeptical Inquirer.

In this chapter, the author does a good job of debunking a variety of phenomenal claims. The first of these is the "no touch knock out," a claim that a highly advanced martial artist can knock people over with just a wave of his hand without physical contact. Unsurprisingly, it works best on people, such as students of the person performing the technique, who believe in it and are aware of what is expected to happen but never on people who don't believe in it. He discusses a variety of physics stunts that are often credited to "Qi" (also spelled or pronounced as "chi" or "ki"), a mystical life force prominent in traditional East Asian thinking and thus frequently a part of martial arts. These include lying on beds of nails, breaking boards or bricks, and walking on hot coals, among others. He also presents a critical discussion of the idea that Qi can aid one's health.

Thalken does an excellent job of carefully analyzing these claims and discrediting them. His analysis is intelligent, his explanations clear and well presented, and his facts carefully footnoted. Only an insecure pedant with an axe to grind could find anything there to criticize.

However, being an insecure pedant with an axe to grind, I now offer some minor quibbles and criticisms. (For the record, I am not just a martial artist but am also someone who in the 1990s went so far as to construct a bed of nails simply so I could lie on it and show people how simple it was. Sadly, the bed of nails became rusty and was tossed years ago.)

First, I found it surprising that Thalken not only failed to cite me ("China, Chi, and Chicanery," by Peter Huston, which is available at http://www.csicop.org/si/show/china_chi_and_chicanery_examining_traditional_chinese_medicine_and_chi_theo) but he also failed to include Leung Ting's fascinating book, *Behind the Incredibles, Vol. 2*.

Additionally, while discussing chi, he also takes a swipe at therapeutic touch, citing the famous Emily Rosa paper in which a young girl allegedly disproved therapeutic touch (TT) in a science-fair project. Although I think it's fair to say that TT has been thoroughly discredited and is not a scientific healing modality, Thalken does not seem aware that there was a controversy around Rosa's paper and its methodology. (See "Perception of Conventional Sensory Cues as an Alternative to the Postulated 'Human Energy Field' of Therapeutic Touch," by Rebecca Long, Paul Bernhardt, and William Evans in the Fall/Winter 1999 issue of *The Scientific Review of Alternative Medicine*.)

As described in Long et al.'s book, Emily Rosa's experiment was based

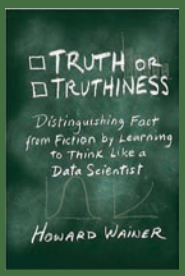
on the valid reasoning that if TT practitioners could detect and manipulate a human energy field, they should be able to feel the presence of an experimenter's unseen hand more often than predicted by chance, which would be about 50 percent of the time. The subjects in Rosa's original study detected her hand only 44 percent of the time, and in a repeat of the study for television, detected it only 41 percent of the time. In other words, they did even worse than chance would predict, at a level that was statistically significant, suggesting problems in the study's methodology.

Long et al. replicated Emily Rosa's experiment with rigorous experimental controls and found that at the hand distance reportedly used in the Rosa study, the test subjects could correctly identify the location of the unseen hand almost 80 percent of the time. Their ability to detect the unseen hand decreased with distance, and placement of a piece of glass between their hand and that of the experimenter effectively prevented the location of the unseen hand from being sensed. The experimenters concluded from this that the test subjects were able to detect the presence of the unseen hand via body heat, suggesting that perhaps TT practitioners mistake perceptions of body heat for sensing the human energy field. Additional testing showed that in a less rigorously controlled study such as Emily Rosa's, inadvertent cues such as leaning an elbow on the table could significantly cue, or miscue, the test subjects, a factor that could have accounted for Rosa's results.

But as stated, these are mere quibbles, minor criticisms at best of an otherwise fine book. If the subjects of this book interest you, seek it out—and even if it doesn't, consider chapter 9 to be must reading for serious skeptics, particularly if interested in fantastic martial arts claims. ■

Peter Huston is an author and teacher of English as a second language. His books are available on Amazon.com and elsewhere. In addition to an MS in teaching English to speakers of other languages, he has a master's degree in East Asian Studies and has lived, taught, and traveled extensively in Asia.

TROLLS: An Unnatural History. John Lindow. Trolls lurk under bridges waiting to eat children, threaten hobbits in Middle Earth, and invade the dungeons of Hogwarts. To explain why trolls still hold our interest, Lindow goes back to their first appearances in Scandinavian folklore, where they were beings in nature living beside a preindustrial society of small-scale farming and fishing. He explores reports of actual encounters with trolls and follows trolls' transition from folktales to other domains in popular culture. Lindow, a professor at the University of California at Berkeley, notes that "in many cultures supernatural beings can indeed be part of people's empirical experience. . . . It is fair to say that the troll has been one of the most important and enduring images of otherness in large parts of the world." The book is detailed and scholarly but offers much for the casual reader and amateur folklorist (or cryptozoologist). Reaktion Books, 2014, 160 pp., $27.



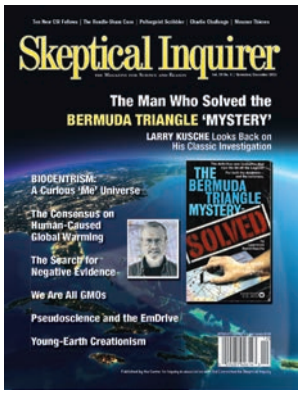
TRUTH OR TRUTHINESS: Distinguishing Fact from Fiction by Learning to Think Like a Data Scientist. Howard Wainer. Wainer, a distinguished research scientist at the National Board of Medical Examiners and a statistician, laments the turning away from evidence in the assertion by everyone from politicians to educators of all manner of claims about today's world. He shows how we can escape the clutches of truthiness by applying the skeptical mindset of a data scientist to expose truthiness, nonsense, and outright deception. He evaluates the evidence, or lack thereof, supporting claims in many fields, with special emphasis in education. Cambridge University Press, 2016, 210 pp., $29.99.

The WISEST ONE in the ROOM
HOW YOU CAN BENEFIT FROM SOCIAL PSYCHOLOGY'S MOST POWERFUL INSIGHTS
THOMAS GILOVICH and LEE ROSS

THE WISEST ONE IN THE ROOM: How You Can Benefit from Social Psychology's Most Powerful Insights. Thomas Gilovich and Lee Ross. Two noted professors of psychology write beneficially for us all on wisdom (with its three components: knowledge, insight, and judgment). Unlike intelligence, wisdom demands some insight and effectiveness around people. The authors draw on research in social psychology, judgment, and decision-making, which has illuminated how and why people are quick to draw conclusions when they'd be better served by stepping back and taking a broader perspective. Their goal is twofold: to help you be wiser so you can be more effective with colleagues, friends, and family and to acquaint you with the broader principles that provide the foundation for that practical advice. An article based on their first chapter appears in this issue. Free Press, 2015, 307 pp., $26.00.

THE WRONG HANDS: Popular Weapons Manuals and Their Historic Challenges to a Democratic Society: Ann Larabee. For well over a century the United States government has regarded the circulation of weapons manuals and instruction booklets as dangerous and criminal. Ann Larabee traces the nuanced history of do-it-yourself weapons manuals from the late nineteenth century to the present to explain their role in the state's evolving policy toward radical dissent. The book covers a wide variety of topics from *The Anarchist Cookbook* to Edward Abbey's novel *The Monkey Wrench Gang*, which have been accused of inspiring domestic terrorists. It is an interesting look at the battle between free speech and the right of the public to have access to information that could be dangerous in the wrong hands. Oxford University Press, 2015, 264 pp., $29.95.

—Kendrick Frazier and Benjamin Radford


Skeptical Inquirer
The Man Who Solved the
BERMUDA TRIANGLE 'MYSTERY'
LARRY KUSCHE Looks Back on His Classic Investigation
BIOCENTRISM: A Curious 'Me' Universe
The Consensus on Human-Caused Global Warming
The Search for Negative Evidence
We Are All GMOs
Pseudoscience and the EmDrive
Young-Earth Creationism
THE BERMUDA TRIANGLE MYSTERY SOLVED

The Bermuda Triangle Manufactured Mystery

Many thanks for the article by Larry Kusche (a member of my own profession) marking forty years since the publication of his excellent book *The Bermuda Triangle Mystery—Solved* (November/December 2015). (Like a good librarian, he gave his full name, Lawrence David Kusche!)

The Triangle is indeed the classic manufactured mystery, and I call many people's attitude to claims of paranormal powers and phenomena in the Bermuda Triangle approach—asking "We have a mystery. How can we solve it?" not "Is there a mystery? Does anything require explanation?" As Kusche shows, the answer to the question "Why do ships and aircraft vanish mysteriously in that (remarkably elastic!) part of the Atlantic?" is simple: they don't.

A British television program on someone's theories about the Triangle had a contact telephone number (it was before texting and email) and I called it, but the woman who answered could only say that the man had solved the mystery; I just couldn't convey to her that there was no mystery.

I recommend Kusche's contribution, also called "The Bermuda Triangle," to the book *Science and the Paranormal* edited by George O. Abell and Barry Singer (Scribner, 1981) as a good summary of his work on the subject.

Ray Ward
London
United Kingdom

I enjoyed Kusche's article on the solution of the Bermuda Triangle mysteries. It brought back memories of the popular media of the 1970s. I even wasted some time and money in following the mysterians' attempt to solve this great mystery. However, I think Kusche's statements at the end of his article [the last two full paragraphs about the broader need for skepticism and critical thinking in everyday life, politics, and health] are the most important for today. I have typed them with full credit to the author and magazine and will distribute to persons who I think need to read this advice.

Frank Filemyr
Milton, Delaware

Young-Earth Creationism

In "The Devil and the Details" (November/December 2015), Jérémie Harris and Edouard Harris argue that it is impossible for young-Earth creationists, such as Ken Ham of Answers in Genesis, to reconcile the fact that the scientific evidence overwhelmingly supports the great age of the Earth with "the broader theistic view of the biblical god as a benevolent and loving friend to humanity," which, of course, creationists accept.

I am not convinced that their argument is decisive. At bottom, they are advancing the knotty problem of evil in a particularly restricted version—with respect, that is, to the evil of the misleading nature of the scientific evidence that the Earth is billions of years old—and considering (and rejecting) only two possible solutions to it. But perhaps they would not claim to have provided a decisive argument in their brief article.

More important, Harris and Harris wrongly presuppose that young-Earth creationists would acknowledge the fact that the scientific evidence overwhelmingly supports the great age of the Earth. While there are a few young-Earth creationists who acknowledge that fact, whether grudgingly or forthrightly, the current predominant strategy—as with the Answers in Genesis ministry—is to deny the fact outright.

According to Answers in Genesis, creationists and evolutionists examine the same evidence but condition their interpretation of it on their presuppositions. Creationists presuppose the existence of God and the authority of the Bible, and they interpret the scientific evidence accordingly, as confirming that the Earth is thousands of years old. Evolutionists reach a contrary conclusion because they presuppose the irrelevance of God and the Bible.

Of course, it is not my intention to defend such a view of the relationships among evidence, interpretation, and presupposition, which is transparently concocted to insulate creationism from empirical critique altogether. But anybody interested in "confronting the . . . perspective of young-Earth creationism head-on," as Harris and Harris avow themselves to be, ought to have a complete idea of what it is that they are likely to encounter.

Glenn Branch
National Center for Science Education
Oakland, California

"The Devil and the Details" posits two young-Earther scenarios: maybe the evidence pointing to an ancient Earth has been "planted" by Satan to deceive mankind, or maybe God himself chose to produce evidence of an ancient Earth for reasons known only to him. The authors then rationally refute both scenarios.

Skeptics recognize that resolute *faith* in the "truth" of one or the other of the two creation myths in Genesis 1 and 2, or in some convenient muddling together of the two, is sufficient to compel true believers to conceive such nonsense and to deny all evidence to the contrary.

In that respect they're just like flat-Earthers, who deny the world is round, refute "proofs" of round Earth theory (another "It's just a theory" situation?), and struggle to uncover the "conspiracy" to withhold the truth from the public (yawn…). These denials are so universally considered preposterous that their rational refutation is no longer necessary. So maybe just ignoring young-Earthers for long enough would see rational refutation of their dogma become unnecessary as well.

Bill Schwarz
Louisville, Colorado

Is it "deja vu all over again," or did we just go through a fifty-year time loop? I am wondering because I just read an almost verbatim rendering of a conversation I had with my high school buddies from 1965. Except Harris and Harris ("The Devil and the Details") missed the bit about how awesome it would have been to have seen the collapse of the "Bridge of the Gods."

I grew up suffused by a culture of skepticism with a father passionate about science who just happened to be a very good natural teacher. Even as I would try variations on the themes as recorded by Harris and Harris, my inner voice would scream, "Just open your eyes!" Sigh, I grew up at the southern edge of the Scablands. Ancient geology was not a classroom lecture. It was a daily "in your face" reality for those of us connected to the real world.

The fact that after five decades this is still a thing grinds on the nerves a bit. Perhaps, this new generation will have better success than mine. See you in another fifty years. . . .

Robert I. Price
Department of Physics (retired)
University of Nebraska
Kearney, Nebraska

Harris and Harris respond:

Believers in young-Earth creationism (YEC) may be united by a common ontology, but they can be broadly divided into two groups based on the thought process to which they subscribe. The first group takes Genesis as unquestioned fact and systematically

interprets all observations in a way that is consistent with the Biblical account. The second group claims to hold to the YEC perspective for evidentiary reasons: they would, and do, argue that the YEC view is the one that would be reached after a dispassionate examination of the available evidence. It would be a mistake to ignore this latter body of YEC believers, who at least contend that their views are the outcome of a rational thought process that does not presuppose the factual accuracy of the Bible. Our article was inspired by successive encounters with several members of the YEC community who hold such views. Our argument is that this evidentiary YEC position is not consistent with belief in a god that is both omnipotent and benevolent.

If the logic of our article is accepted, one is constrained to admit that there is no way to conclude that the YEC narrative is true without finally appealing to a tautological argument: In defending YEC, one ultimately reaches a point at which the question, "Why do you believe in young-Earth creationism?" can only be met with the answer, "I do not know."

'We Are All GMOs'

The Skeptical Inquirer is to be congratulated for providing rational support for GMO with the article by Matan Shelomi, "We Are All GMOs" (November/December 2015) and the brief report in the September/October issue about Michael Specter's talk on GMOs at the CFI "Reason for Change" conference.

Not covered, however, is the question of GMO labeling, which is being pushed by those opposed to GMOs and has received editorial support in our local newspaper, the *New Bedford Standard-Times*, and with the sponsoring of a petition by the Consumer's Union.

Those who support the use of "organic" foods argue that some of these GMOs may be harmful, noting particularly the use of GMO crops that resist weed-killer, Monsanto's Roundup, resulting in greater use of Roundup and harming wild vegetation and exposing us to more pesticide on the food we eat. However, it is not the GMO that may be harmful but the weed-killer. It would make more sense for government agencies to place restrictions on the weed-killer than to require an ambiguous GMO label to be placed on all food products that are not organic.

A GMO label tells the consumer nothing about the nature of the GMO.

GMO labeling is not about providing useful information to the consumer. Forbidding or requiring such labeling reflects the political/economic struggle between the organic producers and agribusiness. It provides a scarecrow meant to scare consumers into buying organic non-GMO products. It appears to be little more credible than calling products that are not organic "inorganic."

David W. Briggs
Marion, Massachusetts

Regarding "We Are All GMOs" by Matan Shelomi: Natural gene transfers between very different species are qualitatively equivalent to genetic engineering, but Shelomi ignores two differences: (1) Natural transfers must spread slowly from the single organism in which they occur. GMOs are rapidly spread all over the planet by their human creators. And (2) natural transfers occur at a far lower pace. By Shelomi's own numbers, natural transfers occur about once every 1.6 million years per species. We see new GMOs every two years or so. This pace of drastic genetic changes to our food is most certainly unnatural. That doesn't prove it's unsafe, but it does call for unbiased safety testing.

R. Allen Gilliam
Longwood, Florida

The article "We Are All GMOs" makes me more nervous about GMOs. The information about horizontal gene transfer is interesting, but if the fact it has happened in the past means it is okay, then I wouldn't be worried about climate change. Context clearly matters. If the author had just presented the information as a way of countering subjective impressions, I wouldn't be more concerned. Instead, the author trots out a few references that claim GMOs are safe and good. The author does not even mention that environmentalists are very concerned about farm worker safety and ecological effects of GMOs such as Round-up-tolerant crops. Nor does he show any awareness that a corporation might not properly balance societal benefits when in the presence of a potential corporate benefit. This failure makes the author's argument appear to be a straw man argument, rather than an attempt to educate. The possibility that the author's attitude is common makes me more worried about GMOs.

Robert Clear
Berkeley, California

Matan Shelomi responds:

Thanks for the comments. In regard to Gilliam's letter, his concern over the speed of GMO spread applies just as easily to conventionally bred crops. They are also genetically modified, just using different methods. So there is no reason to expect GMOs to be more or less safe in terms of their global use than anything else we bred and since globalized, from apples to cows. The point of my article was to show the naturalness of the method. As for the rate of horizontal gene transfers, I suspect they are very, very frequent. Maybe daily, if we include microbes! We have underestimated the prevalence of lateral gene transfer for so long, who knows what the real rate is?

In regard to Clear's letter, the "few references" I cited were meta-analyses, or reviews of many other papers. In total nearly 3,000 [!] different studies have been done on GMOs, and nearly all found no risks. So to worry about GMOs is like believing vaccines cause autism: cherry picking one or two fear-mongering papers, likely retracted ones, and ignoring the hundreds of papers revealing the truth. As for environmentalists, if Round-up is a problem, then ban Round-up. Non-GMO crops might use it too, while plenty of GMOs won't use it at all. So an environmentalist who obsesses over GMOs is like an anti-drunk driving activist banning all clear liquids: it ignores the main problem, and is neither a specific nor selective enough treatment anyway. Plus there are the GMOs designed to be environmentally friendly: Bt crops make their own, organic insecticide, meaning farmers need not spray insecticides at all. One could also make GMOs that need less fertilizer or less water, which is great for the environment and humanity. If you read my article and still fear GMOs, then you did not read my article carefully enough. Check out the meta-analyses that keep coming out and your concerns will be addressed.

[FEEDBACK

The letters column is a forum on matters raised in previous issues. **Letters should be no longer than 225 words**. Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@csicop.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122.

SKEPTICAL ANNIVERSARIES

by Tim Farley

March 3, 1951: *Watch Mr. Wizard* premieres on WNBQ in Chicago.

March 6, 1976: Self-proclaimed demon hunters Ed and Lorraine Warren "investigate" the Amityville Horror house with a camera crew from a local TV station.

March 13, 1781: The discovery of Uranus creates a bit of a crisis for astrologers, as there are no longer a perfect seven celestial bodies as assumed (five visible planets plus the sun and moon).

March 18, 1981: Weekly Italian TV science program *Quark* premieres, hosted by CICAP founder Piero Angela.

April 7, 2001: A student gives oral argument for a PhD in astrology at the University of Paris, causing protests by French skeptics (presaging the recent Australian case where a PhD was issued for a thesis promoting vaccine conspiracy theories).

April 8, 2001: The Mars Global Surveyor spacecraft takes a high resolution photo of the so-called "Face on Mars," revealing it to be merely a mesa. Even radio host Art Bell tells Richard Hoagland to admit defeat.

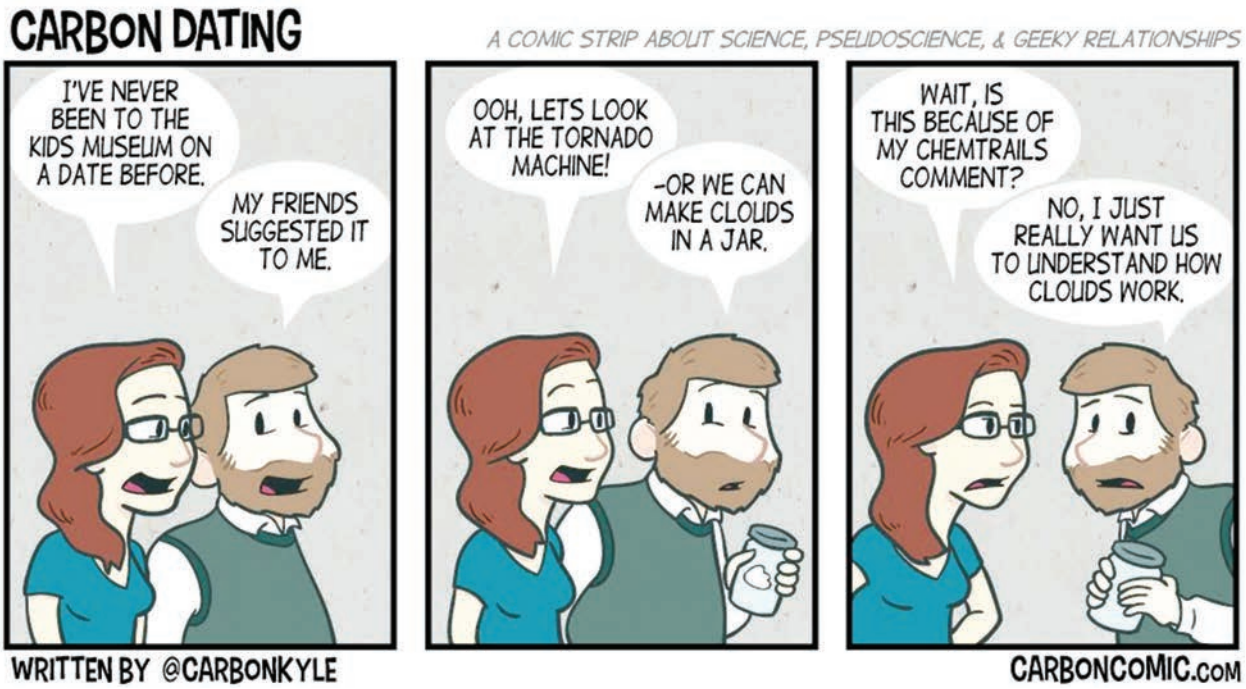
April 9, 1991: David Shaw wins the Pulitzer Prize for Criticism for his 12,000-word series decrying his own paper's coverage of the McMartin preschool trial, the most famous of the "Satanic Panic" cases of the 1980s. The first of the series was titled "Where Was Skepticism in Media?"

April 9, 1991: An interview with James Randi in the *International Herald Tribune* sparks a lawsuit by Uri Geller, triggering Randi's resignation from CSICOP and eventual creation of his own foundation.

April 22, 1986: In a famous segment on *The Tonight Show Starring Johnny Carson*, James Randi exposes faith healer Peter Popoff's use of a radio earpiece to fake seemingly miraculous abilities.

April 30, 1976: CSICOP is founded at a conference titled "The New Irrationalism" at SUNY Buffalo.

Tim Farley is the creator of the website whatstheharm.net and blogs at skeptools.com. He is a past fellow of the James Randi Educational Foundation.


CARBON DATING
A COMIC STRIP ABOUT SCIENCE, PSEUDOSCIENCE, & GEEKY RELATIONSHIPS
I'VE NEVER BEEN TO THE KIDS MUSEUM ON A DATE BEFORE.
MY FRIENDS SUGGESTED IT TO ME.
OOH, LETS LOOK AT THE TORNADO MACHINE!
-OR WE CAN MAKE CLOUDS IN A JAR.
WAIT, IS THIS BECAUSE OF MY CHEMTRAILS COMMENT?
NO, I JUST REALLY WANT US TO UNDERSTAND HOW CLOUDS WORK.
WRITTEN BY @CARBONKYLE
CARBONCOMIC.COM

Committee for Skeptical Inquiry

Scientific and Technical Consultants

Gary Bauslaugh,
writer and editor,
Victoria, B.C., Canada

Richard E. Berendzen,
astronomer, Washington, DC

Martin Bridgstock,
senior lecturer, School of Science,
Griffith Univ., Brisbane, Australia

Richard Busch,
magician/mentalist, Pittsburgh, PA

Shawn Carlson,
Society for Amateur Scientists,
East Greenwich, RI

Roger B. Culver,
prof. of astronomy, Colorado State Univ.

Felix Ares de Blas,
prof. of computer science,
Univ. of Basque, San Sebastian, Spain

Nahum J. Duker,
assistant prof. of pathology,
Temple Univ.

Taner Edis,
Division of Science/Physics
Truman State Univ.

Barbara Eisenstadt,
psychologist, educator, clinician,
East Greenbush, NY

William Evans,
prof. of communication,
Center for Creative Media

Bryan Farha,
prof. of behavioral studies in
education, Oklahoma City Univ.

John F. Fischer,
forensic analyst, Orlando, FL

Eileen Gambrill,
prof. of social welfare,
Univ. of California at Berkeley

Luis Alfonso Gámez,
science journalist, Bilbao, Spain

Sylvio Garattini,
director, Mario Negri Pharmacology
Institute, Milan, Italy

Susan Gerbic,
founder and leader of the Guerilla Skepticism on Wikipedia (GSoW) project

Laurie Godfrey,
anthropologist, Univ. of Massachusetts

Gerald Goldin,
mathematician, Rutgers Univ., NJ

Donald Goldsmith,
astronomer; president, Interstellar Media

Alan Hale,
astronomer, Southwest Institute for Space
Research, Alamogordo, NM

Clyde F. Herreid,
prof. of biology, SUNY Buffalo

Sharon Hill,
geologist, writer, researcher, creator and
editor of the *Doubtful News* blog

Gabor Hrasko,
chairman of the European Council of Skeptical Organizations (ECSO), president
of Hungarian Skeptics

Michael Hutchinson,
author; Skeptical Inquirer
representative, Europe

Philip A. Ianna,
assoc. prof. of astronomy,
Univ. of Virginia

William Jarvis,
prof. of health promotion and public health,
Loma Linda Univ., School of Public Health

I.W. Kelly,
prof. of psychology, Univ. of Saskatchewan,
Canada

Richard H. Lange,
MD, Mohawk Valley Physician
Health Plan, Schenectady, NY

William M. London,
California State Univ., Los Angeles

Rebecca Long,
nuclear engineer, president of Georgia
Council Against Health Fraud, Atlanta, GA

John R. Mashey,
computer scientist/executive (Bell Labs, then
Silicon Valley), analyst of climate-change
denial, contributor to *DeSmogBlog* and
Skeptical Science,
Portola Valley, CA

Thomas R. McDonough,
astrophysicist, Pasadena, CA

James E. McGaha,
astronomer, USAF pilot (ret.)

Joel A. Moskowitz,
director of medical psychiatry, Calabasas
Mental Health Services, Los Angeles

Matthew C. Nisbet,
associate professor of communication
studies, public policy, and urban affairs at
Northeastern University

Julia Offe,
neurobiologist, science journalist, creator
of German Science Slam

John W. Patterson,
prof. of materials science and
engineering, Iowa State Univ.

James R. Pomerantz,
prof. of psychology, Rice Univ.

Gary P. Posner,
MD, Tampa, FL

Tim Printy,
amateur astronomer, UFO skeptic, former
Navy nuclear reactor operator/division chief,
Manchester, NH

Daisie Radner,
prof. of philosophy, SUNY Buffalo

Robert H. Romer,
prof. of physics, Amherst College

Karl Sabbagh,
journalist, Richmond, Surrey, England

Robert J. Samp,
assistant prof. of education and
medicine, Univ. of Wisconsin-Madison

Steven D. Schafersman,
asst. prof. of geology, Miami Univ., OH

Chris Scott,
statistician, London, England

Stuart D. Scott Jr.,
associate prof. of anthropology,
SUNY Buffalo

Erwin M. Segal,
prof. of psychology, SUNY Buffalo

Carla Selby,
anthropologist / archaeologist

Steven N. Shore,
prof. of astrophysics, Univ. of Pisa, Italy

Waclaw Szybalski,
professor, McArdle Laboratory, Univ.
of Wisconsin-Madison

Sarah G. Thomason,
prof. of linguistics, Univ. of Pittsburgh, PA

Tim Trachet,
journalist and science writer, honorary
chairman of SKEPP, Belgium

David Willey,
physics instructor, Univ. of Pittsburgh, PA

Affiliated Organizations | United States

ALABAMA
Alabama Skeptics, Alabama. Emory Kimbrough. Tel.: 205-759-2624. 3550 Watermelon Road, Apt. 28A, Northport, AL 35476

ARIZONA
Tucson Skeptics Inc. Tucson, AZ. James McGaha. Email:mcgaha@skepticus.com. 5100 N. Sabino Foothills Dr., Tucson, AZ 85715

Phoenix Area Skeptics Society (PASS) http://phoenixskeptics.org Email: phoenixskeptics@gmail.com

Phoenix Skeptics, Phoenix, AZ. Michael Stackpole, P.O. Box 60333, Phoenix, AZ 85082

CALIFORNIA
Sacramento Organization for Rational Thinking (SORT) Sacramento, CA. Ray Spangenburg, co-founder. Tel.: 916-978-0321; Email: kitray2@comcast.net. PO Box 2215, Carmichael, CA 95609-2215 http://home.comcast.net/~kitray2/site/

Bay Area Skeptics (BAS) San Francisco–Bay Area. Eugenie C. Scott, President. 1218 Miluia St., Berkeley, CA 94709. Email: scott@ncse.com. www.BASkeptics.org

Independent Investigations Group (IIG), Center for Inquiry–Los Angeles, 4773 Hollywood Blvd, Los Angeles, CA 90027. Tel.: 323-666-9797. www.iighq.com

Sacramento Skeptics Society, Sacramento. Terry Sandbek, President. 4300 Auburn Blvd. Suite 206, Sacramento CA 95841. Tel.: 916 489-1774. Email: terry@sandbek.com

San Diego Association for Rational Inquiry (SDARI) President: Tom Pickett. Email: pickett.thomasj@gmail.com. Program/general information 619-421-5844. www.sdari.org. Postal address: PO Box 623, La Jolla, CA 92038-0623

CONNECTICUT
New England Skeptical Society (NESS) New England. Steven Novella M.D., President. Tel.: 203-281-6277; Email: board@theness.com. 64 Cobblestone Dr., Hamden, CT 06518 www.theness.com

D.C./MARYLAND
National Capital Area Skeptics NCAS, Maryland, D.C., Virginia. D.W. "Chip" Denman. Tel.: (240) 670-6227. Email: ncas@ncas.org. PO Box 8461, Silver Spring, MD 20907-8428 http://www.ncas.org

FLORIDA
Tampa Bay Skeptics (TBS) Tampa Bay, Florida. Rick O'Keefe, contact person. Tel.: 813-505-7013; Email: tbs@centerforinquiry.net. c/o O'Keefe, 4011 S. Manhattan Ave. #139, Tampa, FL 33611-1277. www.tampabayskeptics.org

ILLINOIS
Rational Examination Association of Lincoln Land (REALL) Illinois. Bob Ladendorf, Chairman. Tel.: 217-546-3475; Email: chairman@reall.org. PO Box 20302, Springfield, IL 62708 www.reall.org

Chicago Skeptics Jennifer Newport, contact person. Email: chicagoskeptics@gmail.com. www.chicagoskeptics.com

LOUISIANA
Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM) Louisiana. Marge Schroth. Tel.: 225-766-4747. 425 Carriage Way, Baton Rouge, LA 70808

MICHIGAN
Great Lakes Skeptics (GLS) SE Michigan. Lorna J. Simmons, Contact person. Tel.: 734-525-5731; Email: Skeptic31@aol.com. 31710 Cowan Road, Apt. 103, Westland, MI 48185-2366

Tri-Cities Skeptics, Michigan. Dr. Gary Peterson. Tel.: 989-964-4491; e-mail: peterson@svsu.edu. www.tcskeptics.blogspot.com

MINNESOTA
St. Kloud Extraordinary Claim Psychic Teaching Investigating Community (SKEPTIC) St. Cloud, Minnesota. Jerry Mertens. Tel.: 320-255-2138; Email: gmertens@stcloudstate.edu. Jerry Mertens, Psychology Department, 720 4th Ave. S, St. Cloud State Univ., St. Cloud, MN 56301

MISSOURI
Skeptical Society of St. Louis (SSSL) St. Louis, Missouri. Michael Blanford, President. Email: info@skepticalstl.org. 2729 Ann Ave., St. Louis, MO 63104 www.skepticalstl.org

St. Joseph Skeptics
P.O. Box 8908
St. Joseph MO, 64508-8908

NEVADA
Reno Skeptical Society, Inc.,
Brad Lutts, President.
Tel.: (775) 335-5505;
Email: info@RenoSkeptics.org. 18124 Wedge Parkway #1052 Reno, Nevada 89511. www.RenoSkeptics.org

NEW MEXICO
New Mexicans for Science and Reason (NMSR) New Mexico. David E. Thomas, President. Tel.: 505-869-9250; Email: nmsrdave@swcp.com. PO Box 1017, Peralta, NM 87042. www.nmsr.org

NEW YORK
New York City Skeptics Michael Feldman, president. PO Box 5122 New York, NY 10185. www.nycskeptics.org

Central New York Skeptics (CNY Skeptics) Syracuse. Lisa Goodlin, President. Tel: (315) 636-6533; Email: info@cnyskeptics.org, cnyskeptics.org PO Box 417, Fayetteville, NY 13066

OHIO
Central Ohioans for Rational Inquiry (CORI) Central Ohio. Charlie Hazlett, President. Tel.: 614-878-2742; Email: charlie@hazlett.net. PO Box 282069, Columbus, OH 43228

Cleveland Skeptics Joshua Hunt, Co-Organizer, www.clevelandskeptics.org

South Shore Skeptics (SSS) Cleveland and counties. Jim Kutz. Tel.: 440 942-5543; Email: jimkutz@earthlink.net. PO Box 5083, Cleveland, OH 44101 www.southshoreskeptics.org

Association for Rational Thought (ART) Cincinnati. Roy Auerbach, president. Tel: (513)-731-2774, Email: raa@cinci.rr.com. PO Box 12896, Cincinnati, OH 45212. www.cincinnati skeptics.org

OREGON
Oregonians for Science and Reason (O4SR) Oregon. Jeanine DeNoma, president. Tel.: (541) 745-5026; Email: wilkinsa@peak.org; 39105 Military Rd., Monmouth, OR 97361. www.04SR.org

PENNSYLVANIA
Philadelphia Association for Critical Thinking (PhACT), Bob Glickman President. 653 Garden Road Glenside PA 19038. 215-885-2089 E-mail: President@phact.org. Website: www.phact.org

TENNESSEE
Rationalists of East Tennessee, East Tennessee. Carl Ledenbecker. Tel.: (865)-982-8687; Email: Aletall@aol.com. 2123 Stonybrook Rd., Louisville, TN 37777

TEXAS
North Texas Skeptics NTS Dallas/Ft Worth area, John Blanton, Secretary. Tel.: (972)-306-3187; Email: skeptic@ntskeptics.org. PO Box 111794, Carrollton, TX 75011-1794. www.ntskeptics.org

VIRGINIA
The James Randi Educational Foundation. James Randi, Director. 2941 Fairview Park Drive, Suite 105 Falls Church, VA 22042 Email: jref@randi.org Telephone: 571-318-6530

Science & Reason, Hampton Rds., Virginia. Lawrence Weinstein, Old Dominion Univ.-Physics Dept., Norfolk, VA 23529

WASHINGTON
Seattle Skeptics
www.seattleskeptics.com

The organizations listed above have aims similar to those of the Committee for Skeptical Inquiry but are independent and autonomous.
Representatives of these organizations cannot speak on behalf of CSI. Please send updates to Barry Karr, P.O. Box 703, Amherst NY 14226-0703.
International affiliated organizations listed at www.csicop.org.

CENTERS FOR INQUIRY
www.centerforinquiry.net/about/branches

Transnational
3965 Rensch Road, Amherst, NY 14228
Tel.: (716) 636-4869

Austin
PO Box 202164, Austin, TX 78720-2164
Tel.: (512) 919-4115

Chicago
chicago@centerforinquiry.net

Indianapolis
350 Canal Walk, Suite A, Indianapolis, IN 46202
Tel.: (317) 423-0710

Los Angeles
4773 Hollywood Blvd., Hollywood, CA 90027
Tel.: (323) 666-9797

Michigan
3777 44th Street SE, Grand Rapids, MI 49512
Tel.: (616) 698-2342

New York City
33-29 28th St. Astoria, NY 11106

San Francisco
email: sf@centerforinquiry.net

Tampa Bay
4011 S. Manhattan Ave. #139, Tampa, FL 33611-1277
Tel.: (813) 505-7013

Washington, DC
1020 19th Street., NW, Suite 425
Washington, DC 20036
tel.: (202) 629-2403

Argentina
Buenos Aires, Argentina
alejandroborge@gmail.com
www.cfiargentina.org

Canada
55 Eglinton Ave. East, Suite 307
Toronto, Ontario, M4P 1G8, Canada

China
China Research Institute for Science Popularization,
NO. 86, Xueyuan Nanlu Haidian Dist., Beijing,
100081 China
Tel.: +86-10-62170515

Egypt
44 Gol Gamal St., Agouza, Giza, Egypt

France
Dr. Henri Broch, Universite of Nice, Faculte des Sciences, Parc Valrose, 06108, Nice cedex 2, France Tel.: +33-492-07-63-12

Germany
Arheilger Weg 11, 64380 Rossdorf, Germany
Tel.: +49-6154-695023

India
46 Masi garh, New Friends Colony
New Delhi 110025
Tel.: 91-9868010950

London
Conway Hall, 25 Red Lion Square,
London WC1R 4RL, England

Nepal
Humanist Association of Nepal,
PO Box 5284, Kathmandu Nepal
Tel.: +977-1-4413-345

New Zealand
email: bcooke@centerforinquiry.net

Nigeria
PO Box 25269, Mapo, Ibadan, Oyo State, Nigeria
Tel.: +234-2-2313699

Peru
D. Casanova 430, Lima 14, Peru
email: cipsiperu@yahoo.com

Poland
Lokal Biurowy No. 8, 8 Sapiezynska Sr.,
00-215, Warsaw, Poland

Romania
Fundatia Centrul pentru Constiinta Critica
Tel.: (40)-(0)744-67-67-94
email: CenterforInquiry.Romania@gmail.com

Russia
Dr. Valerii A. Kuvakin, 119899 Russia, Moscow,
Vorobevy Gory, Moscow State Univ.,
Philosophy Department

Senegal
PO Box 15376, Dakar – Fann, Senegal
Tel.: +221-501-13-00